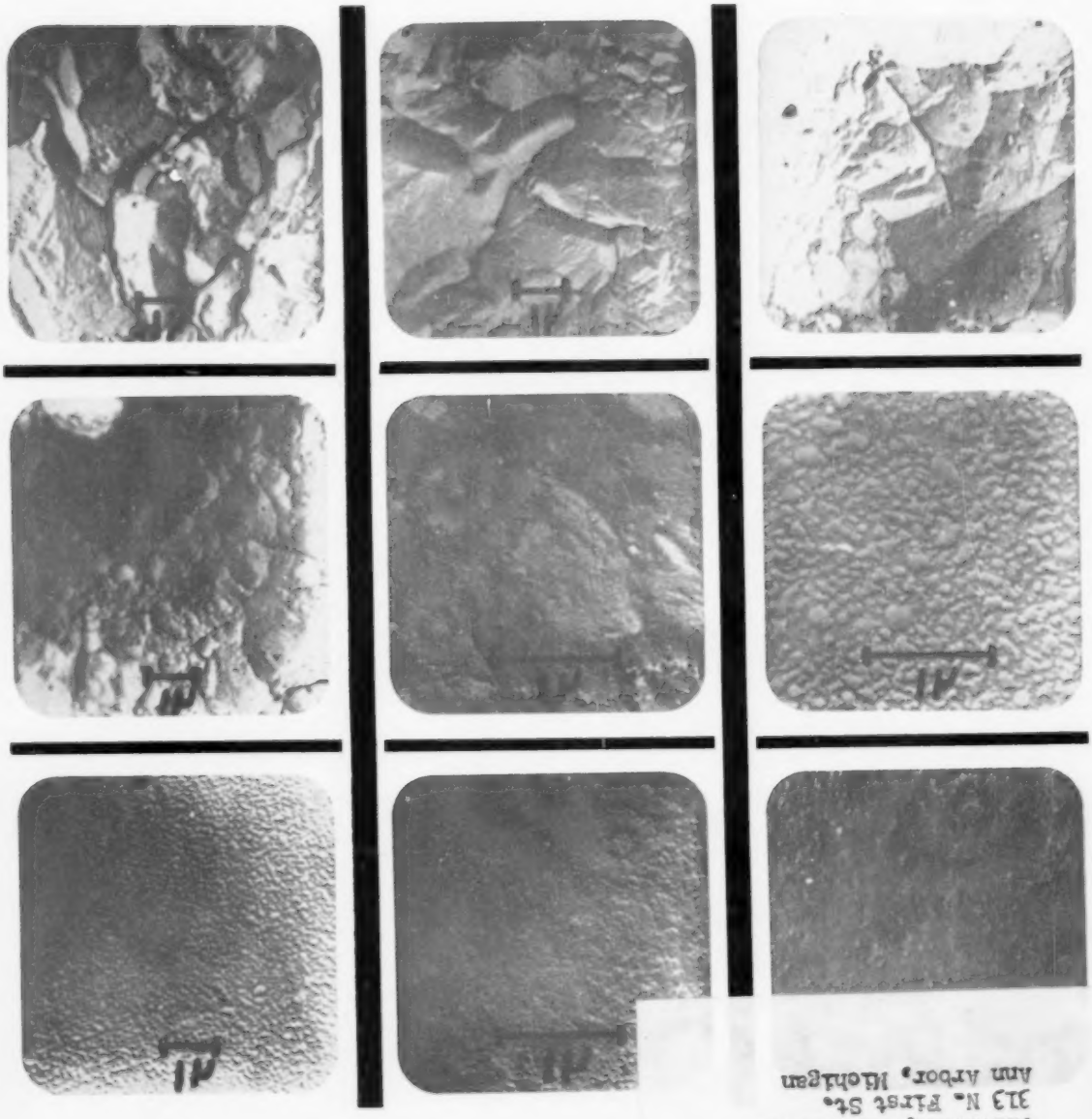
NOVEMBER 1956

plating

JOURNAL OF THE AMERICAN ELECTROPLATERS' SOCIETY



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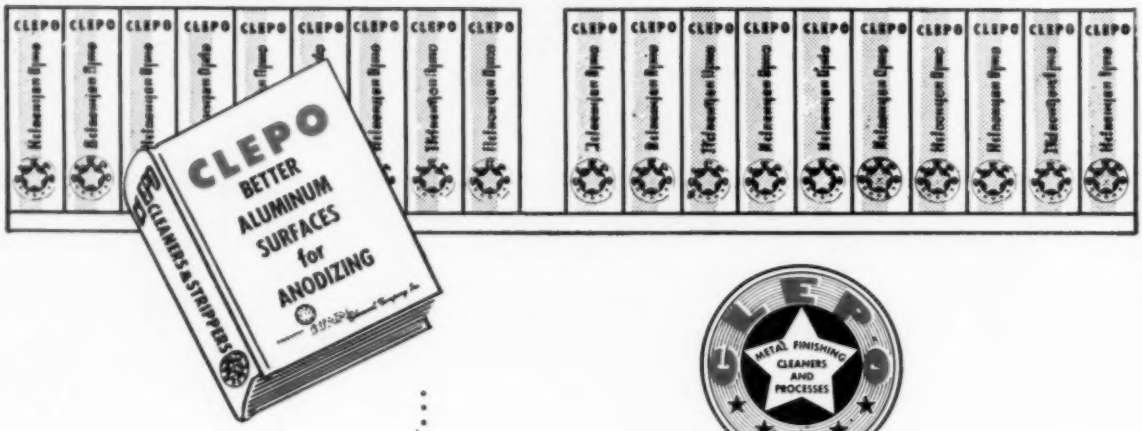

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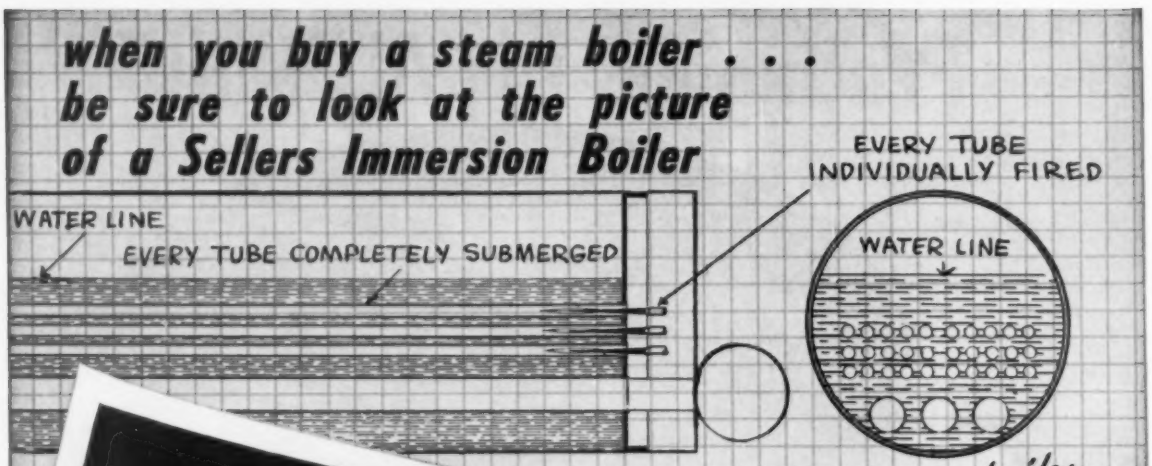

There's no other boiler like a Sellers—

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The long, individually gas fired tubes in the Sellers Immersion Boiler are all completely submerged nearer the water level—and over the return tubes! Heat is therefore uniformly distributed through them—and directly into the water—no where else!

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the average flue gas travel is 15 feet!

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An Educational Society for the Advancement of the Science of Electroplating, the Finishing of Metals and Allied Arts

plating

Journal of the American Electroplaters' Society

November 1956 **Vol. 43, No. 11**

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SOCIETY of BUSINESS MAGAZINE EDITORS

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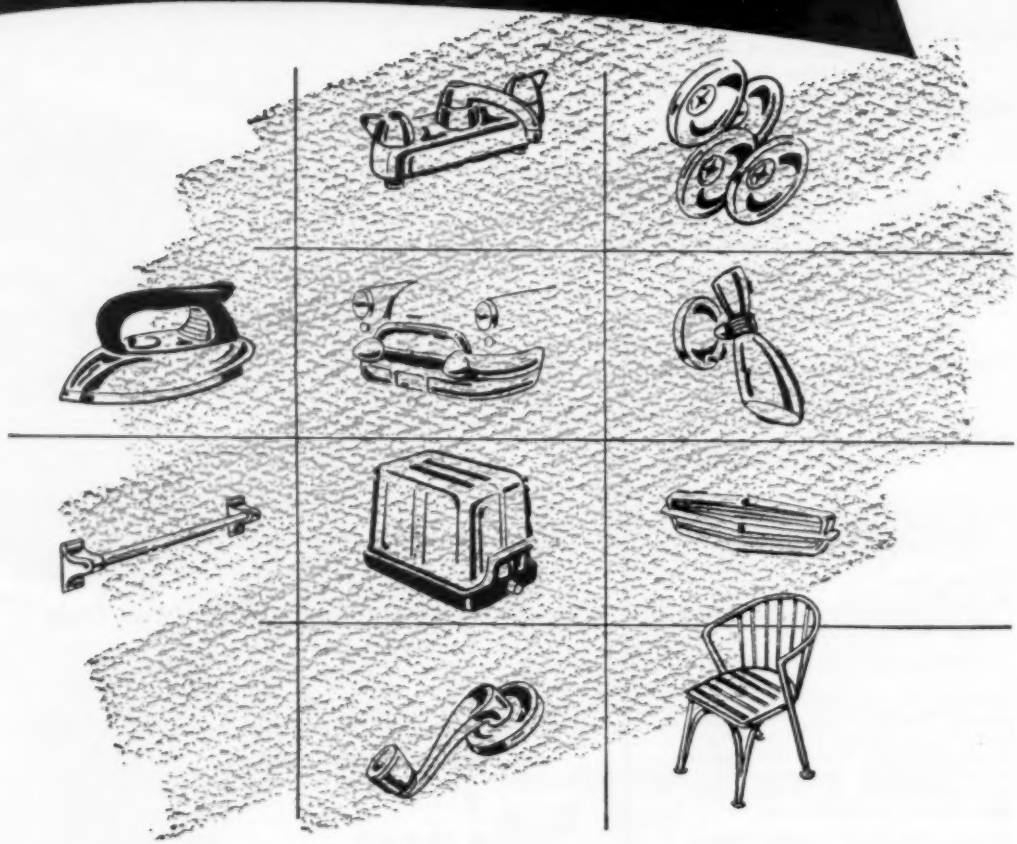
HARSHAW Nubrite

long, bright nickel plating operation without treatment



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EDITORIAL

An Appreciation Upon Assuming Office

"The Third Vice President shall perform such duties as may be assigned him by the President or the Executive Board." So reads the By-laws of the Society.

For my first duty, I was assigned the job of getting acquainted with the many operations of the Executive Board and the National Office. Even in this short time I have found that these "operations" are very extensive, including the direction of the work at National Headquarters, the Society's publications, finances of the Society, plans for Conventions and Expositions and the many Society and inter-society Committees.

As the newly elected Third Vice President, I wish to express my appreciation to the members of the AES for the confidence they have placed in me, and hope that by the grace of the Supreme Ruler of the universe, I may be able to serve in such a way as to be an honor to both the Society and to myself.

Though I am now a member of the Executive Board, I still retain active membership in my home branch, even as each and every one of you. With this membership comes many benefits and privileges. PLATING and regular attendance at the monthly branch meeting, keep us in touch with new developments and offer valuable association with others interested in the same field. These are but two of the many advantages of AES Membership, and as members, we also share in a common responsibility. This responsibility is to make all these benefits available to others by urging them to become members and take part in the activities of our Society.

Every member is on the Membership Committee and should extol AES Membership at every opportunity to all eligible candidates. Don't wait for some "chairman" to ask you to do your duties, but start NOW! An increased membership will offer the benefits of our Society to more people and at the same time enable the Society to be of still greater service to all.

Ralph D. Wysong

3rd Vice President

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Rapid Germanium Rectifiers

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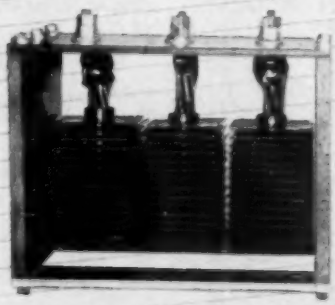
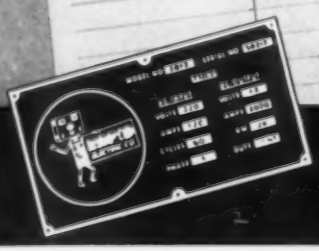
Savings in low operating costs will pay for the unit in a short time.

See your plating distributor for full details.





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You needed it! Wagner developed it! You'll praise it!

NEW . . . BETTER . . . BEST . . ! "Words, words, just another claim," you may think, for rare indeed is anything new really superior in your metal finishing world. But we at Wagner Brothers have spent years on the copper problem and the *production* performance of *our* new ISO-BRITE Process has encouraged us to go all out. So we're making *big claims*. But these claims have already been *proven* by the most critical of production platers—and we're anxious to prove them to you. We offer you . . .

1. Ease of control—and our proof is the voluntary praise of dozens of qualified men in automotive, hardware, plumbing and other fields.
2. High anode efficiency—virtually eliminating costly copper cyanide additions. Just replace drag-out.
3. Much heavier plate—one case previously averaging .0004" increased by ISO-BRITE COPPER to .0008" at the same check points, by eliminating sacrificial wave forms.
4. Freedom from roughness—electrolyte has no inherent tendency or characteristic to promote rough deposit. Our technical staff can advise you on contributing physical or mechanical causes.
5. Fine grained, dense, ductile deposit—fully bright coming out of the bath, easily buffed if your job is steel.
6. Wide operating range—up to 60 amperes per sq. ft. in actual production. Temperature range from 135° to 165°.
7. High tolerance of organic contamination—much less maintenance. Excellent for die castings.

Of course, Wagner ISO-BRITE Copper costs no more than competitive copper solutions—yet it saves money in every way while producing vastly higher quality. We can't hope to have you accept all we claim here; we offer the proof of the pudding. Wire, phone or write for Bulletin 70.2 and the name of the Wagner man in your area.

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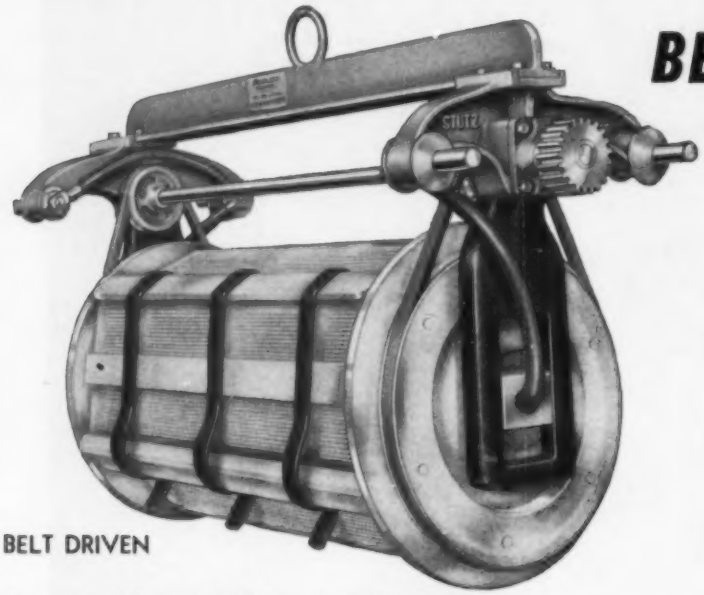


BELT DRIVEN

BELT DRIVEN PLATING BARREL

★ *Lower Initial Cost*

★ *LOWEST Possible Maintenance*

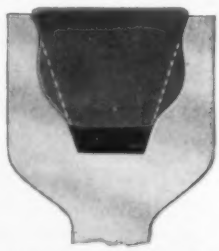
★ *No Cylinder Gears*

★ *No Cylinder Bearings*

Greater Current Carrying Capacity Which Lowers Plating Time and Cost . . .

Stutz Belt Drive complete cycle Plating Barrel. This unit incorporates a cylinder of one piece Plexiglas construction, suspended and rotated by two V belts and arranged between cast steel guide frames protected with 5/16" thick special vulcanized hard rubber. For smooth barrel operation, saddle horns are located on 15" centers, 4 provided for maximum current. Cylinder door is heavily reinforced and is locked with vinyl chloride covered spring steel bung clamps. Cathode contactors are dangler type. These units made to fit most makes of plating tanks and furnished also with motor drives mounted directly on cylinder superstructure. Standard sizes 14"x30" and 14"x36" (I.D.). 12 additional sizes from 12"x24" to 16"x42" (I.D.). Standard perforations 3/32" round on 3/16" centers. Patented dual hole for processing of extremely small parts available.

Specially designed counter pulleys of monel metal with deep dimples for positive grip against belt face.



This shows the belt expanding into the dimples of the driving pulleys. This action provides positive pull with no abrasion to the belt whatsoever.

STUTZ PORTABLE PLATING BARRELS

- The Stutz Portable Barre is made in 2 standard sizes with cylinders having inside dimensions of 6" x 12" and 8" x 18", I.D., and smaller upon application. Standard openings are 3/32". Smaller or larger opening can be furnished as required.
- Baskets in perforated metals or wire mesh.
- Load–Unload Stand for convenient and fast handling of work load

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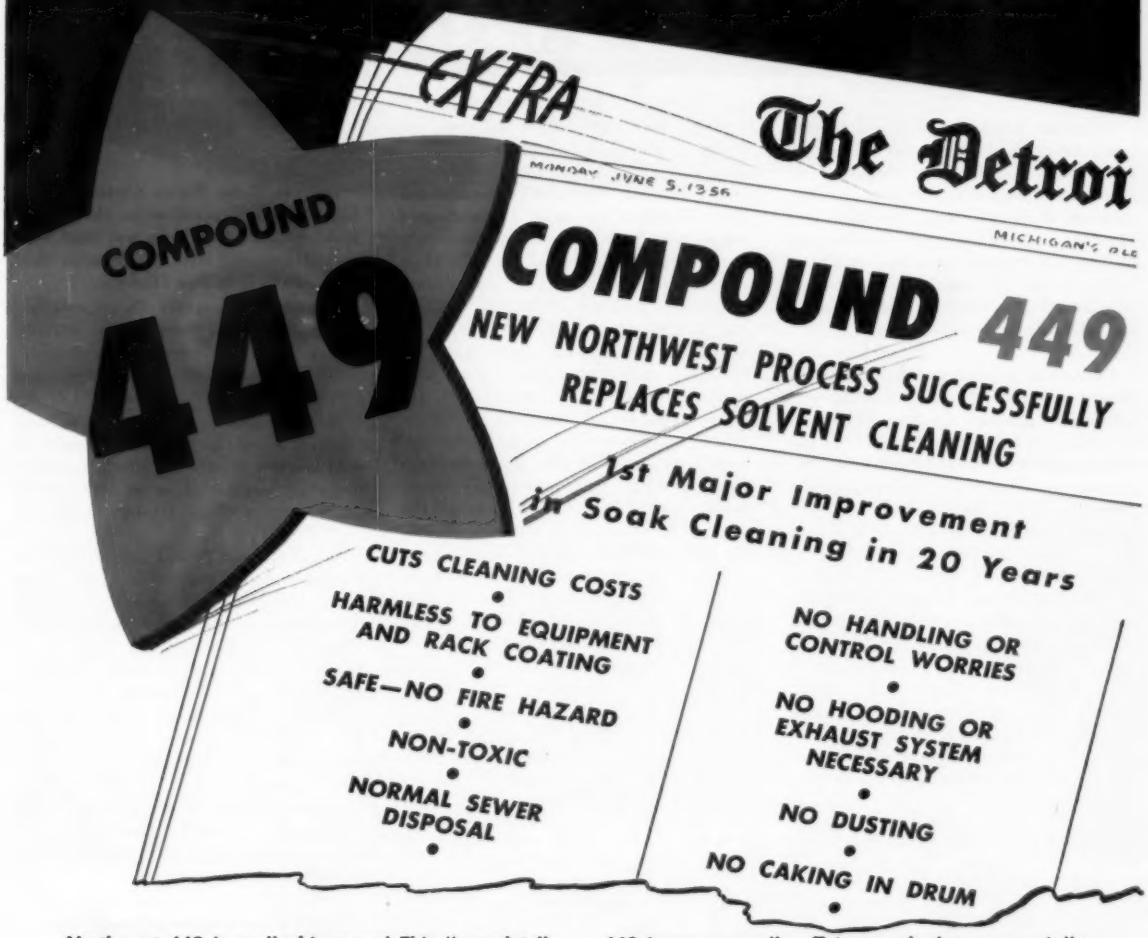

Northwest 449 is really big news! This "complete" new water soluble compound replaces complicated powder and liquid combinations . . . eliminates metal cleaning hazards and disposal problems. It's harmless to rack coating and equipment and makes handling and control simple, easy and SAFE. It will save you time and trouble, and make you money.

449 is an unusually efficient soak cleaner, specially developed for preparing non-ferrous metallic surfaces for plating and finishing operations. 449 has unusually long bath life and wide application range . . . costs no more than ordinary cleaners.

Get our expert analysis of YOUR job by calling or wiring us today.

Remember—the cost per finished piece is the true cost of your cleaner

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INDUSTRY NEWS

Pennsalt Expands—Pennsalt Chemicals is nearly doubling the size of its plant at Chicago Heights, Ill., a unit of its Chemical Specialties Division. Constructed 18 months ago, the plant is a blending, packaging and warehousing facility for Pennsalt specialty products. The new wing, completed in October, is used for offices, a small control laboratory and additional warehouse space.

Filtration Engineers Now American Machine and Metals Subsidiary—Filtration Engineers, Inc., manufacturers of continuous rotary vacuum filters for the plating and metal finishing industries has become a subsidiary of American Machine & Metals, Inc. The announcement was made by Charles V. Anderson, American Machine & Metals president.

Through the move, according to Anderson, Filtration Engineers becomes affiliated with two other American Machine & Metals subsidiaries prominent in the manufacture of related solids-liquids separation equipment. These are Niagara Filters, makers of horizontal and vertical pressure leaf and horizontal plate filters and Tolhurst Centrifugals, manufacturers of equipment for solids-liquids separation by centrifugal force.

Originally consultants in the field, Filtration Engineers, Inc., a 35-year-old Newark, N. J. firm, has to its credit a number of development "firsts" in rotary vacuum drum filtration, the most outstanding of which is the string discharge filter for lifting hard-to-handle cakes from the filter drum in a continuous sheet. Other company design firsts include the FEinc Washing Mechanism, added to filters for recovering solubles without unnecessary filtrate dilution or providing a cake with minimum impurities, and the FEinc Compression Mechanism, used to produce a cake with extremely low moisture content.

In addition to a line which includes rotary vacuum string and scraper filters, horizontal filters, pilot plant filters and the newly-introduced pre-coat filters, Filtration Engineers maintains a fabric division. This FEON division supplies filter media in the new synthetics and fabricates filter cloth bags, covers and elements for all types of pressure and vacuum filters, centrifuges, dust collectors and dry and wet filtration equipment.

Fred M. Kirby II, president of Filtration Engineers, Inc., and Harold M. Small, vice president and sales manager, say that the move, intended primarily to improve service to FEinc customers, will mean no changes either in company policy or personnel.

In becoming the newest American Machine & Metals, Inc. subsidiary the New Jersey firm joins a group of concerns which, besides Niagara Filters and Tolhurst Centrifugals, includes United States Gauge, Riehle Testing Machines, De Bothezat Fans, Troy Laundry Machinery Co., Lamb Electric Co. and Trout Mining Co.

Federated Metals of Canada, Ltd., officially opened its new non-ferrous metal fabrication, processing, and refining plant in Toronto, pictured above, and is rushing completion of its new Montreal facilities. The two plants will have a combined employment of approximately 200 and will smelt and alloy non-ferrous white metals

Detroit Tube Name Changed—The Sharon Steel Corporation has changed the name of its Detroit Tube and Steel Division, Dearborn, Mich., to Sharon Steel Corporation Dearborn Division.

The change, company officials said, was the result of recent changes in manufacturing procedures, a consolidation of operations, integration of the sales force and current expansion of facilities.

Sharon's Dearborn Division is a prime producer of special and regular grades of cold rolled strip steel for the automotive and other metal working industries in the Michigan and Middle Western areas.

New Sylvania Pilot Plant—Construction has been started on a new engineering and pilot production building for the Tungsten and Chemical Division of Sylvania Electric Products Inc.

A three-story brick structure of 48,000 square feet, the new building will house engineering offices, laboratories, and pilot plant facilities for more than 100 scientists, engineers, and technicians. Completion is expected by the middle of 1957.

Sylvania's Tungsten and Chemical Division is a major producer of germanium and silicon for the manufacture of transistors and other electronic devices.

Waste Pickle Liquor Disposal Plant—The nation's first pilot plant for disposing of steelplant waste acid by the Blaw-Knox Ruthner process has been unveiled at Niles, Ohio.

The operation converts spent sulphate liquors into useful sulphuric acid and iron oxide. It is hoped this process will point the way to a solution of the problem of disposal of waste pickle liquor from the steel mills.

The new process represents the steel industry's latest approach to a problem which has stubbornly resisted years of scientific study and research.

The Blaw-Knox Ruthner process was conceived by Othmar Ruthner, an Austrian scientist shortly after World War II. Blaw-Knox carried out a three-year program of extensive development to adapt the process to American standards and to determine the proper materials of construction.

Located at Republic Steel Corporation's Niles Works, the plant will utilize test quantities of Republic's waste pickle liquor.

Most versatile of all fully automatic plating and anodizing machines

New! LASALCO'S Cycleflex

- Cycle changing requires no costly overhaul or rebuilding. Only the positions of pick-up heads need be moved, plus minor tank partition changes.
- New, simple electro-mechanical control and safety device eliminates all possibility of conveyor failure . . makes it impossible to push racks into side of tank . . . prevents load from dropping if power fails during work transfer.
- Unusually low headroom required because no elevating mechanism operates above rack carrier.
- Self-cleaning heavy duty contacts have positive 3-point connection . . . need practically no attention.
- Easily removable rack carriers leave tank surfaces clear . . . an advantage in servicing and in manual plating of large pieces.
- Automatic loading and unloading of parts from standard double-spine racks is available . . . parts can be automatically unloaded while racks stay on machine.

Hydraulic operation, standard; pneumatic operation, optional.

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The Where of Impurities

●

Nickel plate is especially prone to contamination by other metals since most of them tend to plate with the nickel. Removable by dummy plating is the most universal method of removal. Efficient dummy plating requires low voltages, about ¾ volt being optimum. Higher than this wastes nickel and will not remove copper efficiently.

●

The sources of copper contamination are many. Any copper alloy in barrel construction under the solution level may cause contamination even if not connected to the anode or cathode. Nickel salts especially the chloride when added in large amounts will cause contamination. Magnesium chloride is available pure and is recommended whenever possible.

●

Recessed parts of brass or copper also tend to cause contamination if short plating times are used.

●

There is no danger of too much dummy plating. Generally the effects of dummy plating hardly show and the contamination appears to leave quite suddenly.

●

Impure nickel solutions may produce another dark plate and this will clear up to a good white as the solution is purified. And, of course, the best nickel plate is with True Brite Nickel Brightener.

TRUE BRITE CHEMICAL PRODUCTS CO.
P. O. Box 31 OAKVILLE, CONN.

INDUSTRY NEWS BRIEFS

● Speaking before the New York Society of Security Analysts, John A. Sargent, president, **Diamond Alkali Co.**, Cleveland, Ohio, one of the country's leading producers of chromium plating and other industrial and agricultural chemicals, declared his firm will invest the major portion of "$60 to $80-million" at the company's Deer Park Plant at Houston, Texas to expand caustic soda production and "chlorine capacity by some 200 tons per day —approximately a 40 per cent increase."

● A new technique for shipping small grinding wheels has been devised by the **Electro Refractories and Abrasives Corporation**, Buffalo, N.Y.

The new system utilizes double-faced corrugated cartons of interior airfloat construction and cuts down on shipping weight, also eliminates sawdust and shredded packing materials.

● The **International Nickel Company of Canada** has expressed belief its deposits at Moak Lake, in northern Manitoba, will develop into the world's second largest nickel producer. The largest is Copper Cliffs, Ont.

Decision to begin mining at Moak Lake may be made before the end of November. The company has invested $8,000,000 in preliminary development. Henry S. Wingate, president, estimates the cost of getting the nickel deposits into production at $150,000,000.

● Questionnaires have been mailed to all known job platers and captive platers engaged in nickel plating by the Business and Defense Services Administration of the U.S. Department of Commerce. This is an outgrowth of the nickel platers' protest to a Congressional hearing last Winter that they were not receiving a "fair share" of the nation's available nickel supply.

It is rumored that the Defense Department will cut its nickel set-aside requests for military use.

The findings of this survey, which will be kept in confidence by BDSA, must be forwarded to Congress no later than December 31, 1956, to comply with an amendment to the Defense Production Act made by the last Congress.

All nickel platers are required by law to supply the information called for in the report. The total estimated consumption of nickel by the platers will be made public when the survey is completed.

BDSA is asking platers to report on their receipts of nickel anodes and nickel salts for the years 1948, 1949, 1950, 1954, 1955, and the months of January through September 1956.

● For the first time in automotive history, some of the new automobiles will be sporting stainless steel radiator parts for the year 1957.

The announcement follows four years of intensive research on this material for such use. The top and bottom tanks and baffle plate can now successfully be made of stainless steel.

● Engineers of the **Aluminum Company of America** and the **Metallizing Engineering Company** are spraying a highly wear-resistant coating of steel on the aluminum cylinder walls of all-aluminum automobile engine. The special steel coating is said to have eliminated the malfunctions previously experienced when an aluminum piston was moving in aluminum cylinders.

INDICATE A 1110. ➤

OFHC® COPPER

ONLY AMCO MAKES IT

And anodes made of OFHC copper are produced only by AMCO.

OFHC stands for **O**xygen **F**ree **H**igh **C**onductivity copper. OFHC copper is the only oxygen-excluded copper—it is not deoxidized copper.

Plating with OFHC Copper Anodes therefore means:

more usable copper per anode •
smoother finishes •
product uniformity •
no bags or diaphragms •

Technical assistance and additional information available upon request.

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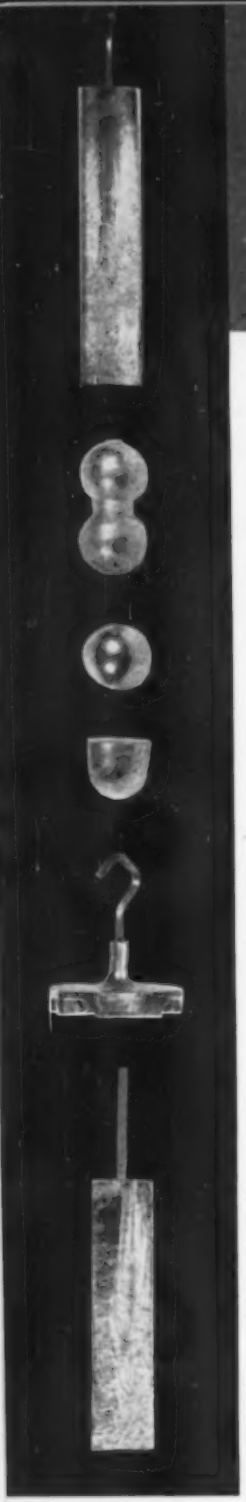

UDYLITE—
A BETTER SOURCE FOR ZINC ANODES

Whatever your requirements for zinc anodes you will be assured of quick delivery from any of eleven Udylite nation-wide stock points.

Udylite zinc anodes are made of virgin metal and every step of manufacture is controlled. You can always depend on Udylite anode quality and purity. Udylite also supplies anodes of zinc aluminum and other zinc alloys.

There are a variety of shapes, too. Balls, Twin Balls, Unodes, Ovals and Flats. The Ovals and Flats are furnished with several hook combinations. Udylite will also furnish special shapes that are cast to your order.

Zinc Ball Anodes, Twin Ball Anodes and Unodes are available for immediate shipment from Detroit, Chicago, Rockford, Grand Rapids, Milwaukee, Cleveland, Atlanta, New York, Philadelphia, Indianapolis and Puerto Rico. Ball Anodes and Unodes are shipped in 250 lb. nonreturnable containers. Oval and Flat anodes are palletized.

Udylite's nearby stock points mean fast delivery so that your production is uninterrupted. Start today to make Udylite your single source for zinc anodes.

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WORLD'S LARGEST PLATING SUPPLIER

INDUSTRY NEWS

New Enthone Distributor Named—Enthone, Inc., New Haven, Conn., manufacturer of chemicals and processes for metal finishing, has appointed Ross Industries, Inc., 5890 Commonwealth Ave., Detroit, Mich., as warehousing distributor for eastern Michigan.

Gilbert Valentine, Enthone technical service engineer, will work with Ross Industries and can be contacted through their office.

American Buff Attains Majority—Employees of the American Buff Company, Chicago, were honored recently at a special luncheon party celebrating the company's 21st anniversary.

Ben P. Sax, president, tendered a "President's Progress Report" outlining the company's growth and achievements in its 21 years. He emphasized especially the many recent engineering improvements and patents which have made American Buff the world's largest manufacturer of buffs and polishing wheels for every metal finishing operation.

At the conclusion of the luncheon, Mr. Sax presented each employee with a canvas bag containing twenty-one silver dollars.

Vanton Opens St. Louis Office—Vanton Pump & Equipment Corporation, Hillside, N. J., a division of Cooper Alloy Corporation, has announced the opening of a sales and service office in St. Louis, Mo.

The office, headed by E. H. Bigden, will handle the company's "Flex-i-liner" pumps, plastic pipe, plastic valves and fittings, and their stainless steel Quikupl fittings, in eastern Missouri and southern parts of Illinois.

Research Foundation Expands—The second step in a $5 million expansion program will be taken this fall by Armour Research Foundation of Illinois Institute of Technology.

Construction will begin this month on a $575,000 addition to the Metals Research Building, according to William M. Cousins Jr., ARF assistant director.

Rapid expansion in metals research has necessitated construction of the four-story addition at 3350 South Federal Street on the Illinois Tech campus.

"The volume of metals research at Armour is at an all-time high," Cousins said, "and double the amount of the presently available space is needed to carry out the projects planned by the metals department."

The first building in the Foundation's $5 million expansion program—a $1,250,000 Physics and Electrical Engineering

INDUSTRY NEWS

Research Building—was completed earlier this year. It houses the nation's first nuclear reactor for industrial research.

Plans call for the construction of two more buildings and the extension of an existing laboratory building.

When completed in 1966, Armour Research Foundation will have one of the most complete industrial research centers in the world.

Construction of the extension at the north end of the Metals Research Building is expected to be completed by late spring 1957.

The extension will give the metals research department an additional 42,000 square feet of space. It now has 20,058 square feet in the present structure.

The 144-foot addition will be constructed of buff brick, steel, and tinted glass to conform with the general architecture of Technology Center, the name given to the 22-block area comprising the IIT campus.

The basement of the new building will house a creep laboratory, mechanical equipment, and a storage area, Cousins explained.

A reception area and an applied metallurgy laboratory will occupy the first floor, while space on the second floor will be devoted to administrative offices, mechanical metallurgy and electro-chemistry sections.

Space on the third floor will be utilized by the powder metallurgy and nuclear metallurgy sections, while the fourth floor will house the physical metallurgy and non-ferrous metallurgy laboratories.

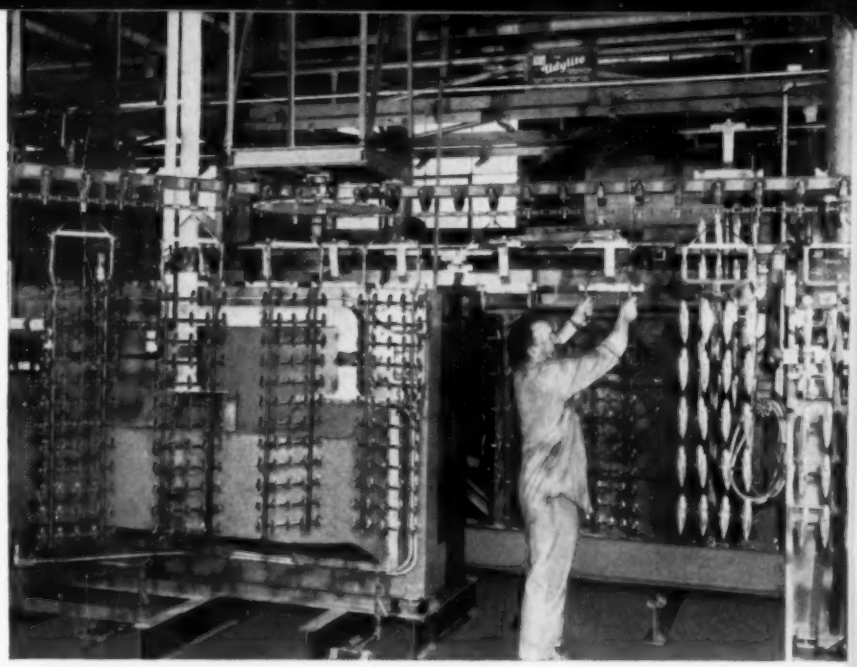
Regional Distributor—Lasalco, Inc., St. Louis manufacturer of electroplating equipment, has been appointed regional distributor for Diamond CPA 1800, a chromium plating additive developed by the Chromium Chemicals Division of the Diamond Alkali Company.

The manufacturer states that cathode current efficiency tests using CPA 1800, show an increase from 30 to 70 per cent over conventional plating processes. Because higher current densities can be used, less plating time is required for deposition of thick deposits. Temperature is reported as being less critical, a feature important in decorative chrome-plating operations. Bright deposits are obtained at temperatures ranging from 70 to 150° F.

Advantages include easier anoding in hard chrome plating and the elimination of oversize plating on large parts.

Plating costs are said to be lower through simplification of rack design and the reduction of chemicals consumed through drag-out.

INDICATE A 1112.



QUALITY IMPROVED—PRODUCTION INCREASED WITH UDYLITE PROCESSES AND EQUIPMENT

In the manufacture of rear view automobile mirrors by Yankee Metal Products Corporation of Norwalk, Connecticut, a variety of die cast parts are used. All of these die cast parts are copper, nickel and chrome plated on the Udylite Full Automatic Plating Machine. Shape and sizes of these parts vary considerably.

The Udylite Full Automatic handles the complete processing of the parts from the bare die castings to a finish ready for final assembly. Its operation has provided perfect precision, a doubled capacity and a minimum of rejects.

Udylite Bright Nickel has played an important part in the perfect coverage of these die castings. With the chrome overlay, Udylite Bright Nickel has provided not only the glistening finish demanded for this luxurious line, but also the guaranteed protection for these accessories which are constantly subjected to attack by the elements.

Hand in hand, Udylite equipment and processes are solving many plating problems. Providing sales appeal finishes—plated protection —multiplied production. Find out how you can use these same advantages.

THE Udylite CORPORATION
DETROIT 11, MICHIGAN

WORLD'S LARGEST PLATING SUPPLIER

INDUSTRY NEWS

Expansion—Several new additions to the Frederic B. Stevens, Inc., Customer Service Laboratory facilities have just been completed. Lab facilities for metal finishing product research, development and customer service work now total 6000 sq ft plus office facilities. The two most recent additions added a total of 360 and 2050 sq ft to the facilities.

The larger addition includes a simulated Stevens Automatic Barrel Line capable of reproducing any barrel plating or processing cycle, including all phases of cleaning. Included is a standard Stevens horizontal plating barrel set-up that permits comparison of maximum controlled effective plating loads for both manual and automatic operations. Four storage tanks and two 2000 amp 24 volt rectifiers are part of the installation. A new Stevens cyanide package waste disposal plant has also been added to the above laboratory facilities and is used for experimental work in that important area.

The second addition to Stevens Customer Service Laboratory consists of a complete buffing composition cleaning set-up. It will enable Stevens to include recommended cleaning cycles as part of future L.V.* (laboratory-verified) Reports on recommended buffing and polishing cycles.

Aluminum Use Increases—Applications of anodized aluminum for automotive trim purposes are increasing steadily. According to a survey conducted under the auspices of Frederic B. Stevens, Inc., leading producers of automatic plating and anodizing equipment, 1957 models will reveal an increasing number of uses of anodized aluminum trim.

A. B. Hoefer, Stevens vice-president, reports, "Speeding the change is the continued tight supply of nickel. Manufacturers have been forced to look for substitutes and like the results aluminum has given them."

Indications of a possible trend are shown on the chart below based on the Stevens survey.

Application for Aluminum Trim	1956 Automobiles	1957 Automobiles
Window Frames	3	6 or more
Grilles	4	6 to 8
Emblems (V, Script, Block, etc.)	4	8
Moldings	3	6 to 9

The increase in aluminum trim on one 1957 model will be approximately from 15 pounds to 27 pounds according to one report.

Further indication of such a trend can be noted from an analysis of anodizing equipment sold. Sales of equipment sold in 1955 (for probable use in 1956) were nearly double the volume for the combined two preceding years. At the same time, sales of Stevens compositions used in buffing and polishing aluminum showed a 50 per cent increase.

Western Metal Congress—More than 5,000 metal working companies in the United States and Canada have received floor plans for the 10th Western Metal Congress and Exposition to be held in Los Angeles, California, March 25 – 29, 1957, according to William H. Eisenman, managing director of the show, and national secretary of the American Society for Metals, show sponsor, whose headquarters are in Cleveland.

Robust younger brother of the Metal Society's gigantic 38th National Metal Exposition and Congress, held this year in Cleveland, October 8 – 12, the Western Metal Show draws in excess of 50,000 spectators from the fast-growing Pacific Coast industrial area. In 1955, a total of 53,639 attended to inspect the more than 440 exhibits in the Western Exposition.

Larger Quarters—Doram Products, Inc., recently located at 410 Frelinghuysen Avenue in Newark, N.J., has moved both factory and offices to a larger, more spacious location at 906 Lincoln Boulevard in Middlesex, N.J.

The corporation, making varnishes and coatings for vacuum evaporation and silver spraying has, by this move, been able to add a complete pilot plant under the name of Irwin Industries for the purpose of proving the various varnishes, coatings and metalizing processes for customers' products.

How Big is a Bubble?
Always big enough to get the parts clean. Never big enough to choke the flow in your washing machine
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Cowles NEW
QC WASHING MACHINE CLEANER
It's alkaline — but more than an alkali. NOW — for the first time — you can use
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THE MODERN CONCEPT— AUTOMATIC PRECISION BARREL PLATING AND PROCESSING

The Stevens "Super-E" Automatic Barrel Plating and Processing machine for high production, quality metal finishes at low cost.

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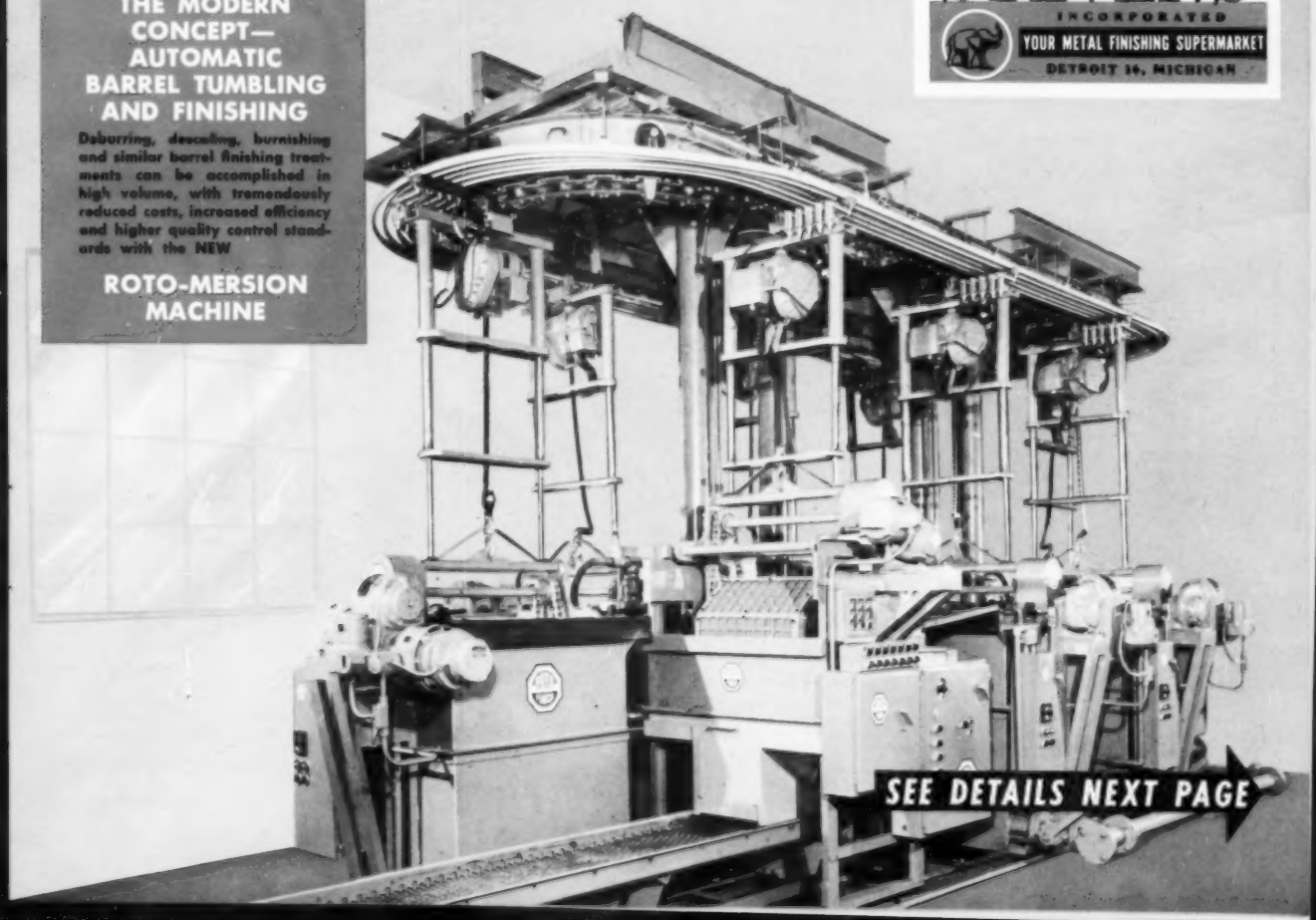
STEVENS
INCORPORATED
YOUR METAL FINISHING SUPERMARKET
DETROIT 16, MICHIGAN

THE MODERN CONCEPT— AUTOMATIC BARREL TUMBLING AND FINISHING

Deburring, descaling, burnishing and similar barrel finishing treatments can be accomplished in high volume, with tremendously reduced costs, increased efficiency and higher quality control standards with the NEW

ROTO-MERSION MACHINE



SEE DETAILS NEXT PAGE

FEATURES OF THE STEVENS SUPER "E"
AUTOMATIC BARREL PLATING AND PROCESSING MACHINE

Designed for the plating or processing of bulk metal parts in large volume. It provides a complete processing cycle of cleaning, acid, strike, plating, rinses, bright dip, chromate dip and drying – all fully automatic, and in one return type unit.

Stevens Automatic Barrel Machines are now being used for copper, tin, cadmium, zinc and nickel plating. They are also now in operation for cleaning, washing, phosphating, stripping, alroking, lubriting and many other similar types of immersion processing.

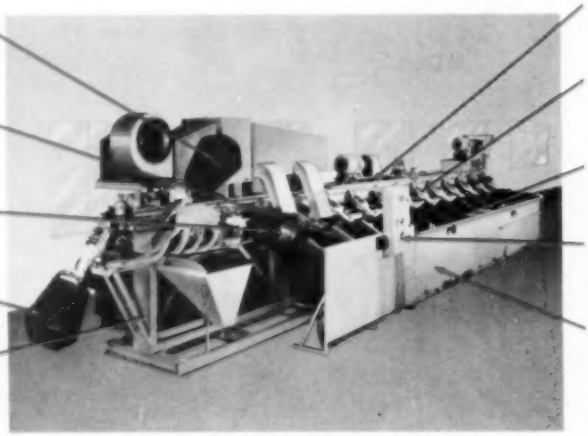
Automatic Load and Unload – is possible since there are no barrel lids to manually open or close.

Waste Control Minimized – because of less dragout, a minimum spillage factor and controlled rinsing.

Less Dragout – is positively assured. Simple, clean construction of cylindrical barrel reduces costly solution carry out.

Guaranteed Production Output – is ensured and known in advance with pre-determined barrel loads.

Low Cost Installation – is possible because mechanism is 100% pre-assembled.



Mechanical Flexibility—resulting from the machine's inherent mechanical simplicity, permits rapid process and production changes.

Minimum Barrel Maintenance – is possible since no gears or other moving parts are ever below solution level.

Human Control Eliminated – because of automatic control of process times, temperature and other variables.

Precision Quality Plating – is a certainty because all operating conditions are pre-determined and automatically controlled.

Longevity and Dependability – are confirmed by the testimony of hundreds of users operating machines far beyond the end of depreciation schedules.

FEATURES OF THE NEW STEVENS-DISTRIBUTED ROTO-MERSION
AUTOMATIC BARREL TUMBLING AND FINISHING MACHINE

What is Roto-Mersion? It is submerged automatic Roto-Finishing. The well known Roto-Finish Processes are now teamed with the new Roto-Mersion Automatic Barrel Processing Equipment. Both are backed up by years of experience and the most complete experimental testing laboratory in the country.

In checking the many important advantages to be gained from using the new Roto-Mersion Machine, be sure to weigh these features:

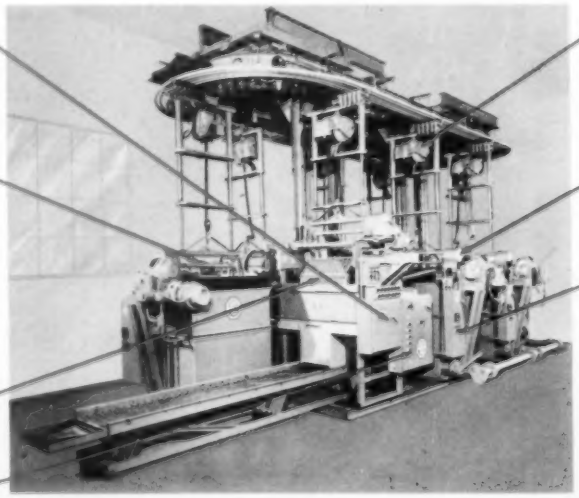
Processing Flexibility—is possible simply by changing chips, compounds and resetting of timing controls.

Greater Economy—results from ability to use compounds and solutions throughout their effective lifetimes.

Large Volume Production – is possible because of continuous automatic operation.

Continuous Production – as loading and unloading are done while processing continues in other tanks.

Full Automatic Control – can be had by using card or tape operational control systems.



Low Finishing Cost Per Piece – offers tremendous savings over standard systems and is possible because of maximum controlled production, minimum handling and savings in compound usage.

Maximum Safety – is insured for both personnel and machine through use of special controls regulating vertical and horizontal transfer.

High Quality Control Standards – can be maintained because of minimum handling and absolute pre-determination of finish specifications.

One-Man Operation—is possible since one complete cycle will clean, descale—grind or burnish, rinse and rustproof parts with no intermediate handling.

FREDERIC B. STEVENS INC., 1800 18th STREET, DETROIT 16, MICHIGAN

Metal Finishing Show—More than 35 manufacturers of machine tools which grind and polish with coated abrasives exhibited their newest developments to the metalworking industry in a Metal Finishing Show held October 30 through November 2 in Cleveland. The working exhibit was sponsored by Behr-Manning Co. of Troy, N. Y., a division of Norton Company, at 4101 West 150th street, the abrasives manufacturer's Cleveland branch.

Designers, production men, quality control men and machine operators submitted their problem components and products to actual grinding and polishing tests on virtually every coated abrasive machine tool developed in this country since the Fall of 1954.

Obituaries

NATHAN RANSOHOFF

Nathan Ransohoff, founder and chairman of the board of Ransohoff, Inc., died September 24 at Cincinnati, Ohio. He had been active in business, civic and philanthropic affairs until a few weeks before his death.

Ransohoff had been characterized as "an outstanding mechanical engineer" and "father of many modern metal surface treatment methods." He was a 1910 graduate of the Massachusetts Institute of Technology and a member of the American Society of Mechanical Engineers and the Engineering Society of Cincinnati.

He founded Ransohoff, Inc. in Cincinnati in 1916 and guided its development into one of the nation's leading manufacturer's of metal cleaning and finishing machinery. In 1953, the firm was moved to Hamilton, Ohio.

Ransohoff was widely known in the metalworking industry. He was a familiar figure at conventions and technical society meetings and a frequent contributor to trade and technical journals.

John R. Strauss, president, and Richard C. Wigger, vice president of the Hamilton firm, expressed the company's keenly-felt loss, since Ransohoff had been an important factor in company progress for more than 40 years.

In addition to his business career, Ransohoff was a prominent Cincinnati civic leader. He was a board member or trustee in a number of civic, educational and church organizations.

RALPH W. CRAIG

Ralph W. Craig, 63, leader of technical service, paint and ink industries for Diamond Alkali Company, died September 29, at Lake County Memorial Hospital, Painesville, Ohio, following a short illness.

A recognized specialist in his field, Craig delivered many lectures on paint and paint problems.

An alumnus of the University of Michigan, he was a member of The American Institute of Chemists, The New York Chemists' Club, and the Cleveland Paint, Varnish and Lacquer Association.

CECIL E. BRIGHAM

Cecil E. Brigham, of Great Neck, N. Y., died suddenly on September 5. He was recognized as an authority on selenium rectification for the electroplating field. For many years he was recognized for his work in the radio-electronic field. His works on selenium life characteristics have been published by the AIEE.

Born in Worcester, Mass., in 1897, he served in the United States Navy in World War I, was a graduate of George Washington University, Columbia University and the Colby Square Conservatory of Music.

For twenty-one years, Mr. Brigham occupied a high position in the International Telephone and Telegraph Company, serving overseas in England and on the Continent. He joined the Wesley Block Corporation in 1942. In 1945 he was elected to the office of executive vice president of the Richardson-Allen Corporation, a division of the Wesley Block Company, Inc.

'nough said!

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PERSONALS

McGuire

Snelgrove

Friedel

Schuerer

Rheinhold

Clabaugh

Stevens Appoints Wisconsin Distributor—Frederic B. Stevens, Inc., Detroit 16, Mich. announces the appointment of the R. F. McGuire Company, Inc., 106 East Melvina Street, Milwaukee 12, Wis., as exclusive distributors for their metal finishing equipment and supply line in the state of Wisconsin.

The R. F. McGuire Company, Inc., is a new corporation headed by **R. F. McGuire,** formerly technical director and sales engineer for Donald Sales and Manufacturing Company, Milwaukee, Wis. McGuire was with the Donald organization for twenty years prior to organizing the new firm. Prior to that time, he was associated with The Udylite Corporation and United Chromium.

Dean H. Snelgrove has been appointed industrial sales representative of Wyandotte Chemicals Corporation J. B. Ford Division covering the Southwestern Michigan area. Snelgrove will headquarter in Battle Creek.

Snelgrove received his chemical education at the Detroit Institute of Technology. He served three years with the U. S. Navy and has been doing sales-service work for the past eight years.

Since joining Wyandotte Chemicals, Snelgrove has been given intensive training in both the Wyandotte Chemicals Research and Technical Service Laboratories.

Morton B. Gilbert, a sales engineer in the Chicago district, has been promoted to the headquarters staff of the High-Vacuum Equipment Division of F. J. Stokes Corporation, Philadelphia, Pa., as a product specialist in charge of sales and product development for batch vacuum metallizing equipment.

G. J. Crowdes has been appointed district manager in charge of Dennis Chemical Company's Ohio regional office. Crowdes was formerly with the B. F. Goodrich Company.

The Dennis Chemical office located at 2475 State Road, Cuyahoga Falls, Ohio, will service the Eastern area which includes Ohio, Pennsylvania, New York and Michigan.

Howard H. Friedel, recently appointed sales engineer to the Process Equipment Division, U. S. Stoneware Co., Akron, Ohio, brings a wealth of experience to his new post.

After receiving his BS in Chemical Engineering from Case Institute of Technology in 1940 he entered into research and development of organic chemicals for Hooker Electrochemical Co. at Niagara Falls, N. Y. During World War II he worked on the government magnesium program at the Painesville, Ohio plant of Diamond Alkali.

Since the war Friedel has been in the sales field specializing in chemical processing equipment for the chemical and metal finishing industries. He is a registered professional engineer in the State of Ohio and is a member of AIChE and NACE.

Edward V. Schuerer has become district representative in the state of Wisconsin and the upper peninsula of Michigan for Torit Manufacturing Co., St. Paul, Minn., and will be responsible for the sales and service of Torit unitized dust collection equipment in this area.

Schuerer has been a manufacturer's agent since 1950. He headquarters at 2625 N. 111th Street, Wauwatosa.

Walter H. Meyer has been named manager of sales of the Vacuum Plating Division of Logo, Inc. Meyer will supervise the field development and sale of vacuum metallizing finishes. Although vacuum metallizing finishes are reported to be of a comparatively recent addition to the Logo line of industrial coatings, four years of concentrated research, coupled with extensive field evaluation, were spent before releasing these coatings to the industry generally.

In addition to a complete line of vacuum metallizing coatings for the first and second surface of thermoplastics, new plating finishes are now available for ferrous and non-ferrous metals as well as thermosetting plastics. Special emphasis in the research on metallizing coatings is said to have been directed toward meeting rigid specifications, such as required by the automotive and appliance industries.

John J. Rheinhold, chief engineer of Richardson-Allen Corporation, College Point, L. I., has been appointed to the position of vice president. Rheinhold is now active in the development of control systems using magnetic amplifiers for DC power supplies produced by the firm.

Rheinhold has become recognized as an authority on magnetic amplifiers; selenium, germanium and silicon rectifiers and has done research and developmental work in this field. He was educated at Pratt Institute and Brooklyn Polytechnical Institute.

Carl C. Clabaugh is the new manager of the metal cleaner department for Cowles Chemical Company, 7016 Euclid Avenue, Cleveland 3, Ohio. He will have full charge of the sale of alkaline metal cleaners, Ty-Bond zinc phosphate metal coatings, anti-corrode oils, and related items.

Clabaugh had been metal cleaner sales manager for Cowles since June 1954, after serving for about a year as assistant manager. He started with Cowles as a metal cleaner salesman in Philadelphia late in 1951.

Previously, Clabaugh had been associated with a manufacturer and supplier of platers' supplies, working in Cleveland and in Cincinnati. He studied chemical engineering at Michigan State University—interrupting his studies to serve in the Air Corps in Italy and Africa during World War II.

Donald G. Patterson has been transferred to Michigan Chrome's Chicago territory. Patterson will be responsible for sales and service in Northern Illinois and Indiana, Wisconsin and Minnesota. Patterson has had several years experience in working with the company's customers in the electroplating and plastisol coating industries.

Adrian J. Stewart, technical representative in charge of Atlas Powder Company's chemicals sales office in Atlanta, has been transferred to its International Chemical Sales Department in Wilmington. Succeeding him in Atlanta is **Robert L. Herrman, Jr.,** formerly in the company's Product Development Department in Wilmington.

DON'T HESITATE!

MICCROSOL SPRAY S-2003 IS READY . . . to show YOU the way to profitable spray jobs

You can apply S-2003 with conventional spray equipment.

You can apply 60 mils thickness in one application without sagging of material. If multiple coats are required, a short cure time is all that's needed between applications. A contrasting color can serve for layer identification, if desired.

You can use S-2003 in all plating baths. It has the same toughness—chemical, corrosion, and abrasion resistance as Miccrosol E-1003. Our adhesive systems provide outstanding adhesion to metal surfaces.

Tanks
Ducts
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Equipment

Solvent additives are not necessary. S-2003 is 100% solids and is sprayed as received. Time consuming and expensive adjustments are unnecessary. Problems of material instability and film cracking are eliminated. There is no solvent loss and less operator fatigue with Miccrosol Spray S-2003.

It's the ideal plastisol for spray applications.

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HAVEG® News

Wherever CORROSION RESISTANCE is a Factor

HAVEG PLASTIC TANKS MEET EVERY SERVICE REQUIREMENT

HAVEG STORAGE TANKS, REACTORS, COLUMNS, TOWERS, PLATING TANKS, FILTERS and similar equipment are now manufactured in every type and size, rectangular and cylindrical—in a wide range of Haveg grades, combined with selected chemically inert materials to provide exceptional resistance to corrosive acids, hypochlorites, salts, alkalies and various oxidizing agents.

HAVEG PLASTIC TANKS are tough and durable. Large Haveg storage tank installations have been in continuous service at leading processing plants as long as twenty-five years—under the most extreme corrosive conditions.

HAVEG TANKS are economical to install . . . easy to maintain. **NEW POLYESTER GLASS** constructions, for example, *cost considerably less installed than lead or rubber-lined, stainless or even mild steel types in many instances* . . . offer bonus savings in reduced steel for support because of their extreme light weight! Haveg plastic tanks require no painting or costly maintenance . . . can be readily field repaired where necessary.

Whether yours is a new or replacement installation, investigate the advantages of Haveg corrosion resistant plastic tanks and process equipment for your process operations. Write for Bulletin C-13.

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Haveg fume duct, hoods, stacks, fans and fittings in the Haveg reinforced plastic best suited to handle the corrosive fumes and gases at your plant, offer the most practical and economical system possible wherever fume removal is an operational requirement.

Engineered for use up to 350°F., Haveg fume removal units are light in weight for easy, low cost installation, or for heavy duty service where required. Hoods are readily molded and joined in varying shapes and sizes . . . stacks up to 12 foot diameter and over 200′ high can be flanged for quick assembly—or resin-welded as a single unit! Complete fittings are available from stock, or can be custom-fabricated to your specific requirements. A Haveg engineer will be glad to assist you in planning a complete system for your plant . . . or selecting Haveg units to replace deteriorated apparatus in your present system.

You can make anything in Haveg that you can make from metal. Haveg is tough, durable, machineable, easily and quickly altered or repaired in the field.

Haveg Bulletins F-7 and C-13 give detailed data on the complete line of corrosion resistant Haveg process equipment and resin cements to solve *every* corrosion problem. Write for your copies at no obligation.

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PERSONALS

John F. Daley, general manager of Du Pont's Organic Chemicals Department, has been elected a director, vice president and member of the Executive Committee of the company.

In other changes, **Samuel G. Baker,** general manager of Du Pont's Photo Products Department, will succeed Daley as general manager of the Organic Chemicals Department, and **John M. Clark,** assistant general manager of the Photo Products Department, will succeed Baker as general manager.

A native of Wilmington, Daley attended Wilmington schools and the University of Virginia, and has been with the Du Pont Company since 1915.

The Organic Chemicals Department will be the third department Baker has headed in his Du Pont career, which began in 1923.

Clark, a graduate of Cornell University, where he obtained a PhD degree in chemistry, started with Du Pont in 1933. In 1945 he was appointed general superintendent of the Photo Products Department and three years later was made assistant general manager.

Donald R. Church has been named chief engineer of Acoustica Associates, Inc., Glenwood Landing, N. Y., designers and manufacturers of ultrasonic cleaning, processing and measuring systems. **Morris Kenny** has been appointed project engineer of the company's recently awarded long range Air Force Missile Systems Development Program while **Martin A. Damast** has been appointed senior electronic engineer.

Church (BS in Mining Engineering, Univ. of Minn., and graduate studies in Electrical Engineering, University of Maryland 1947–1954) and Kenny (BS in Applied Physics, University of California 1949) formerly were staff members of the Ultrasonic Development Group of the Naval Ordnance Laboratory, Silver Springs, Md., and other leading research organizations. Damast (BS in Electrical Engineering, College of City of New York 1949) most recently was associated with Airborne Instruments Laboratory.

The company will double its staff and quadruple its floor space by the end of 1956.

Robert P. Ogden has been appointed general manager of the Industrial Quimica Pennsalt S A de C. V., a new subsidiary of Pennsalt International Corporation in Mexico. This component already has a new plant under construction near Mexico City.

Ogden joined the company after receiving a degree in chemical engineering at Cornell University in 1941. At the time of his appointment, he was manager of Pennsalt's plant at Riverview, Mich.

Tapes that keep plating where you want it!

For clean, positive stop-off masking—regardless of plating solution or surface—you can depend on one of these "Scotch" Brand Tapes for electroplating to do the job...easily, economically: No. 470—a strong, conformable, "all-around" tape that is highly resistant to cleaning and plating cycles. No. 850 Polyester Film Tape—thin and tough; transparent backing; excellent for flat or simple curved surfaces. No. 420 Lead Foil Tape—for use where a "thieving" action is desired. For complete information, ask your "Scotch" Brand Tape distributor, or write 3M Co., Dept. LF-116,

Always specify "Scotch" Brand, the *quality* tape . . . and stick with it!

TAPES FOR ELECTROPLATING . . . *three of more than 300 pressure-sensitive tapes for industry, trademarked . . .*

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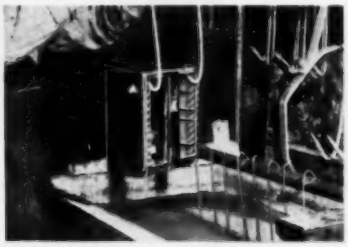
SCOTCH BRAND

Look what you can do with them!

THREADED shaft is masked with "Scotch" Brand No. 850 Tape. High clarity of tape's polyester backing permits continuous inspection for any "creeping under" action.



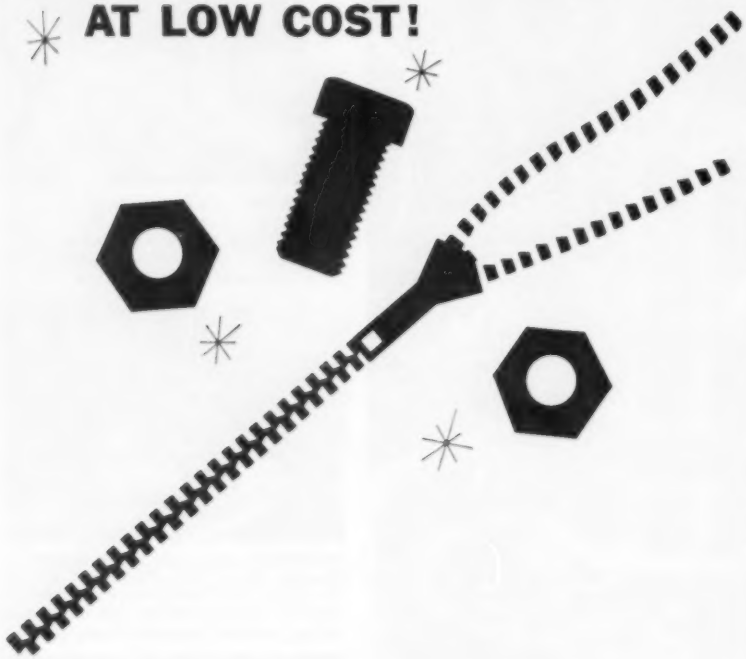
CLEANING racks can be protected by binding them with "Scotch" Brand Tape No. 470. Heavy-duty vinyl backing withstands acids, alkalies, salt water, alcohol, hydrocarbons.

LARGE metal castings can be masked with "Scotch" Brand Tape No. 470 when cleaning or plating. Even on rough surface, tape's adhesive will hold during entire operation.

PROPELLER shaft is quickly and easily masked with No. 420 Tape before critical plating operation. "Thieving" action of lead foil backing successfully reduces edge build-up.

The term "Scotch" is a registered trademark of Minnesota Mining and Manufacturing Co., St. Paul 6, Minn. Export Sales Office: 99 Park Ave., New York 16, N.Y. In Canada: P.O. Box 757, London, Ontario.

BRIGHT FINISH CADMIUM AND ZINC PLATING AT LOW COST!



Cadmax and Zimax, Federated's new addition agents for cadmium and zinc plating baths, eliminate dull, frosty finishes . . . and do it at low cost!

Cadmax for cyanide cadmium plating produces clear, brilliant, blue-white deposits, prevents burning, minimizes staining, does not foam, and is easy to control. An adjuster solution, furnished free with Cadmax, eliminates breaking in the bath, gives perfect plating from the first load.

Zimax for zinc plating produces clear, bright deposits, increases covering and throwing power, and is much more economical to use than similar materials. It is available in powder or liquid form; for barrel or still brightening. It usually may be added without conversion treatment to any zinc solution using a proprietary addition agent.

Experienced laboratory and field personnel are available to give complete technical service, including solution analysis and recommendations. Call or write to Federated's Plating and Electrochemicals Department; or get in touch with your nearest Federated dealer.

Federated first in the new frontier field AMD

Federated Metals

DIVISION OF AMERICAN SMELTING AND REFINING COMPANY
120 BROADWAY, NEW YORK 5, N. Y.
In Canada: Federated Metals Canada, Ltd., Toronto and Montreal

Aluminum, Anodes, Babbitts, Brass, Bronze, Die Casting Metals, Lead, Lead Products, Magnesium, Solders, Type Metals, Zinc Dust

1308 FOR FURTHER INFORMATION, USE READER SERVICE CARD: INDICATE A 1118.

PERSONALS

Sayers

Root

Robert P. Sayers has been named manager of Link-Belt Company's Duluth, Minn. district office.

Sayers joined Link-Belt in 1931 after graduating from the University of Alabama with a degree in engineering. He also attended the University of Illinois and Northwestern University.

Since 1945, Sayers has been a district sales engineer in Link-Belt's Chicago sales office. Before this, he served in the shop, engineering, and sales departments of the firm's Pershing Road plant in Chicago.

Ted Root has taken over the Michigan territory for Michigan Chrome & Chemical Company, Detroit, Mich.

Root has been working in the firm's laboratory developing applications for the Micro coatings. Prior to joining Michigan Chrome & Chemical Company, Root attended the University of Michigan and Wayne State University and had considerable experience in the transportation industry.

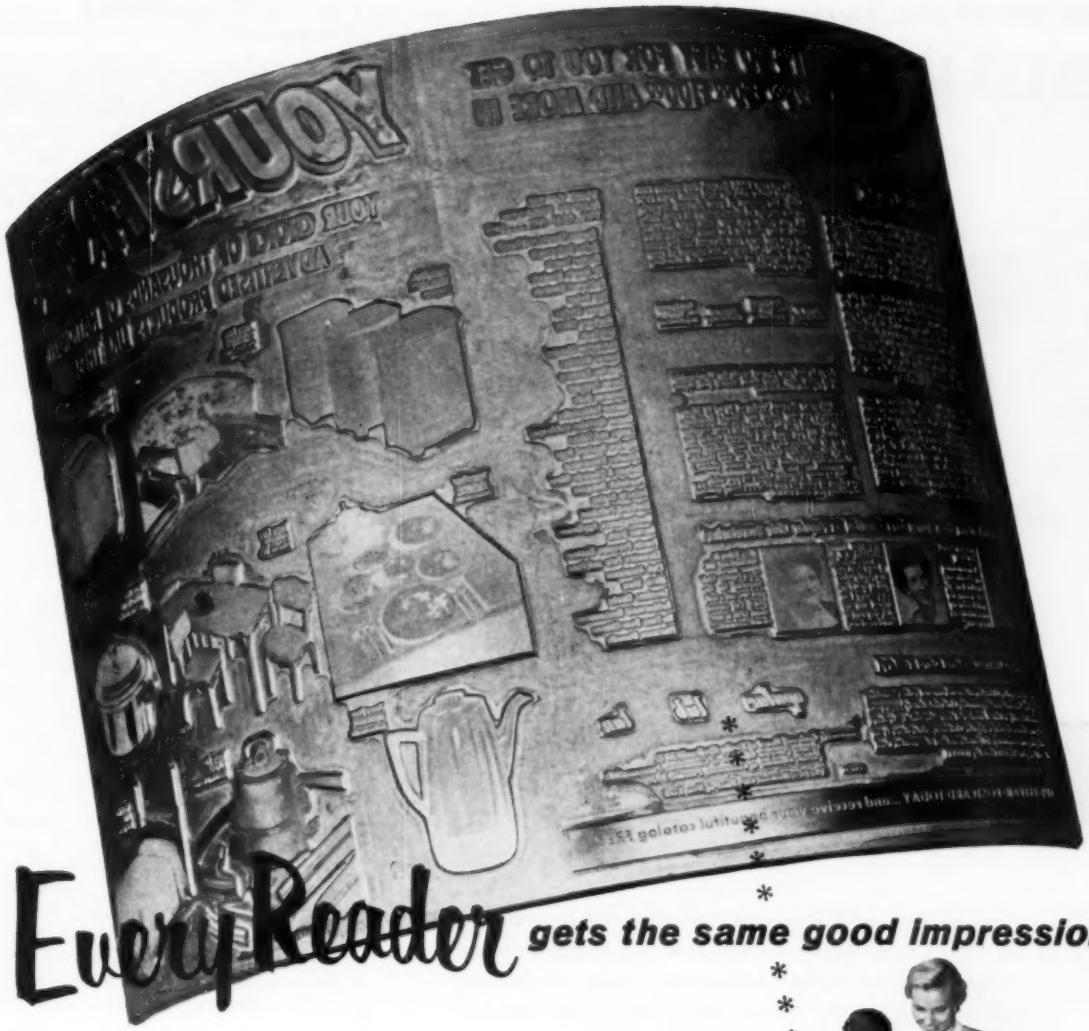
Dr. Harold J. Dawe, for more than a decade in charge of Research and Development at Acheson Colloids Company, Port Huron, Mich., has been appointed technical staff consultant of Acheson Industries, Inc., headquartering at Port Huron.

Dr. Dawe's new responsibilities will include the supervision of technical activities at all seven Acheson Industries plants located in the United States, England and Holland.

Until his successor at Acheson Colloids is appointed, he will continue to supervise research and development for Acheson Colloids Company.

George H. Merz recently was named sales engineer by Allied Research Sales Corporation, marketing subsidiary of Allied Research Products, Incorporated, manufacturers of the Iridite line of chromate conversion coatings and ARP plating chemicals. Merz will handle the Eastern Ohio-Western Pennsylvania territory from headquarters in the Bulkley Building, Cleveland 15, Ohio.

He has a long background of experience in the metal finishing industry. Prior to his new association, he was an independent consultant in the field and before that built a long record of sales-service work with the Harshaw Chemical Company.



Every Reader gets the same good impression

• *Magazines with circulations running in the millions are faced with a serious problem. When the type or half-tone dots wear down to the shoulder of the etch, the result is a poor reproduction.*

To save press down-time in replacing worn plates, and to be sure of the same fine impression on the last part of the run, plates must have surfaces that are resistant to abrasion. That's why printers use chromium-plated letterpress plates, electrotypes and gravure rolls. Then they are certain of getting clear impressions on every sheet from the first to the last.

As a manufacturer of Chromium Chemicals, Mutual is proud to emphasize their use in the American publishing field.

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ALLIED CHEMICAL & DYE CORPORATION
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CHROMIC ACID
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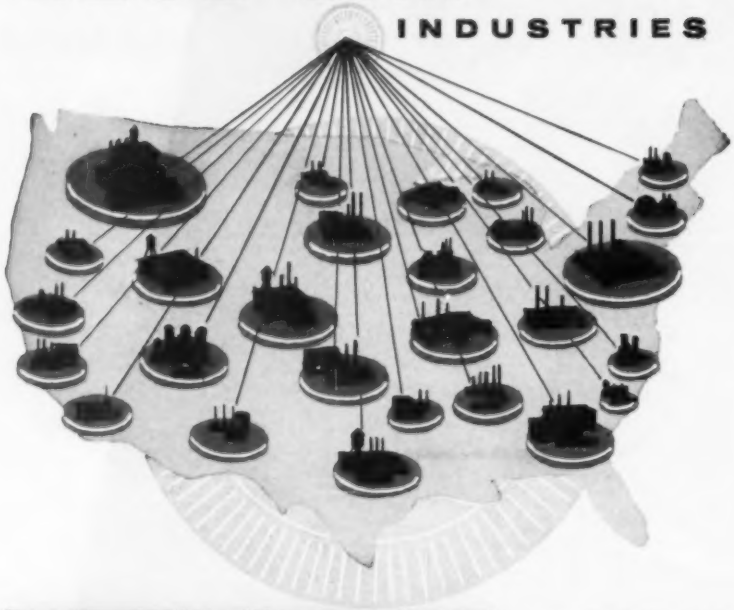
AMMONIUM BICHROMATE

Choice of the Nations

BLUE CHIP INDUSTRIES



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Meaker equipment is used for efficient and economical plating by many of the nation's most important builders of such products as automobiles, appliances, machinery, furniture and many others. When they install Meaker engineered equipment they are assured that it is designed to meet specific requirements. They are also certain that Meaker will stand behind the equipment during its whole operational life, making sure that it produces the best possible plating job at reasonable unit costs.

Meaker has accomplished much for other manufacturers. Why not find out what we can accomplish for you? Our engineers will be happy to survey your problems with you and recommend the equipment you need. Call or write today!

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● Full Automatic and Semi-Automatic Plating Machines ● Strip Steel Plating Equipment ● Wire Galvanizing Equipment ● Batch Type Plating Machines ● Pickling Machines ● Motor Generators for Plating ● Processing Conveyors ● Rectifiers for Plating

PERSONALS

George Karian, for the past two years a specialist in the sales of powder metal and industrial compacting presses and for the preceding five years engineer in charge of design of this equipment, has been appointed manager of the Tabletting Division of F. J. Stokes Corporation, Philadelphia, Pa. In his new post, Karian will supervise all product design, sales, and customer service activities for the complete range of Stokes hydraulic and mechanical compacting presses, for powder metal, ceramic, plastics preforming, pharmaceutical, and other industrial compacting applications, including ordnance manufacture and automatic assembly.

Karian, who was born in Binghamton, N. Y., was graduated from Pennsylvania State University in 1949 with a BS in Mechanical Engineering, and joined the Stokes organization immediately thereafter. He is a member of the American Society for Metals and the American Ordnance Association.

A. C. Benning long connected with the manufacture, sale and technical service of electroplating chemicals for the parent company in the United States has been appointed manager of the newly formed Harshaw Chemicals, Ltd., of England.

S. E. Pross of Hounslow has been appointed assistant general manager. Among his previous connections, Pross had an extended tour of duty with the Kubwait Oil Company in the Persian Gulf area.

Production in the plant will be limited at first to chemicals and materials for operating the Perflow, Perglow, Nubrite and Nibrite processes of electroplating. Other items manufactured by Harshaw are expected to be added as market demands can be developed.

Peter Veit of Larchmont, N. Y., has been appointed sales and service engineer by Enthone, Inc. In this capacity, he will sell to and service customers in the Manhattan and Bronx areas of metropolitan New York, working under the direction of **Derick S. Hartshorn, Jr.,** metropolitan district manger.

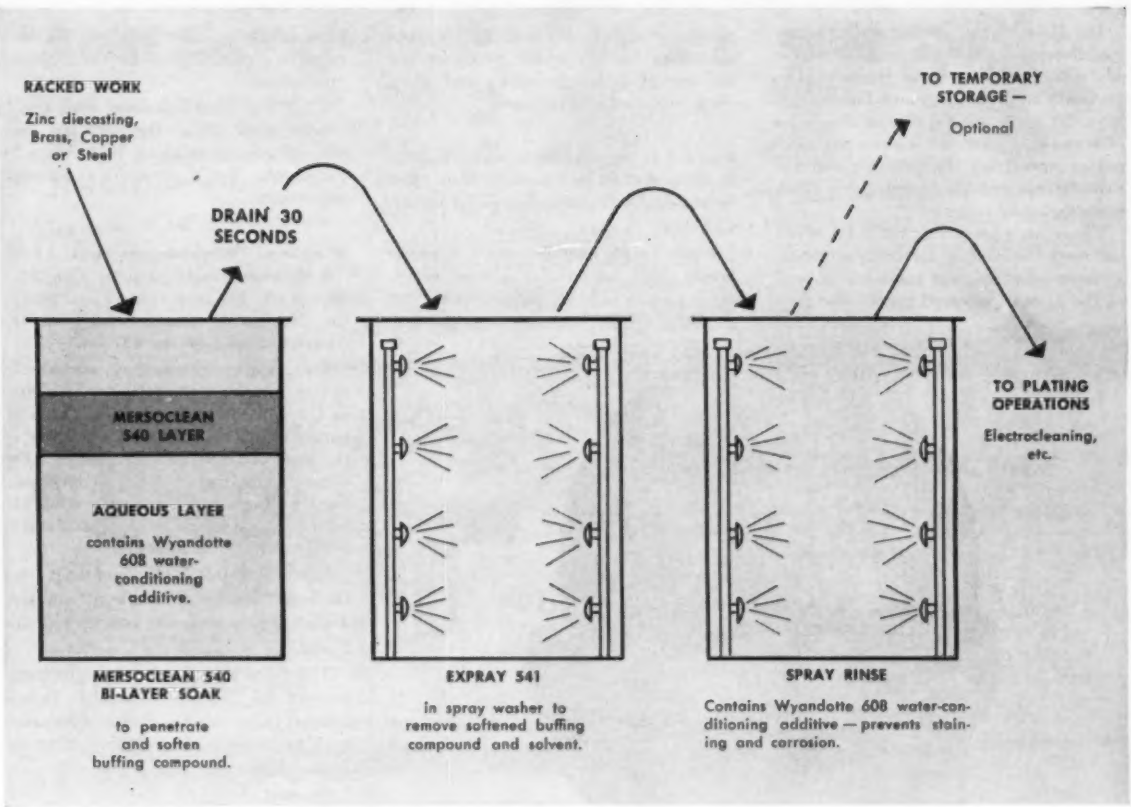
Veit is a chemical engineering graduate of Brooklyn Polytechnic Institute and has had considerable experience in production, sales and technical service for metal finishing. He served for several years as technical service engineer on metal cleaning problems and more recently was employed in the Production Engineering Department of Grumman Aircraft Corporation and as sales engineer for Heil Equipment Company.

Derick S. Hartshorn, Jr., has recently been promoted from sales and service engineer to district manager of the New York City, Westchester and Long Island area. In his new capacity, Hartshorn will be in charge of all sales and service work and personnel in his area.

New MERSOCLEAN 540 Bi-Layer Process

WHISKS AWAY STUBBORN BUFFING COMPOUND

from zinc diecastings, brass, copper, and steel!


RACKED WORK
Zinc diecasting, Brass, Copper or Steel
DRAIN 30 SECONDS
TO TEMPORARY STORAGE — Optional
TO PLATING OPERATIONS
Electrocleaning, etc.
MERSOCLEAN 540 LAYER
AQUEOUS LAYER
contains Wyandotte 608 water-conditioning additive.
MERSOCLEAN 540 BI-LAYER SOAK
to penetrate and soften buffing compound.
EXPRAY 541
in spray washer to remove softened buffing compound and solvent.
SPRAY RINSE
Contains Wyandotte 608 water-conditioning additive — prevents staining and corrosion.

Here's a new precleaning process for buffed metals proved effective on *millions of diecastings!* It's Wyandotte's MERSOCLEAN 540 Bi-Layer Process. It completely removes buffing compounds, even in deep crevices; and it results in fewer rejects, less labor, increased production.

Greater Safety

This process practically banishes fire hazards, hand swabbing, obnoxious odors; is safe, nontoxic. It reduces cleaning costs, while giving improved cleaning.

More thorough cleaning

Wyandotte MERSOCLEAN 540 Bi-Layer Process costs less than solvent degreasing — yet is more effective. It does a more thorough job than wetting agents and soap mixtures. Even when castings or parts are heavily soiled with impacted or baked-on buffing compounds, this revolutionary process whisks them clean, insures bright plating *all over!*

Easy to use

Control of solutions is easily accomplished by non-technical personnel with simple, free kits provided for users.

Why not look into Wyandotte's MERSOCLEAN 540 Bi-Layer Process for your own operations? Even though the process may require some modifications of existing equipment, we believe it to be worthy of serious consideration wherever buffing- or polishing-compound removal is a problem, because it provides a *foolproof* way of removing all commonly used compounds. We have skilled representatives, trained to help you. Contact the one nearest you, today! *Wyandotte Chemicals Corporation, Wyandotte, Michigan. Also Los Nietos, California. Offices in principal cities.*

Wyandotte CHEMICALS

J. B. FORD DIVISION

THE BEST IN CHEMICAL PRODUCTS FOR METAL FINISHING

PERSONALS

Dr. J. Herbert Hollomon of the General Electric Research Laboratory has been named as advisory editor for a new "Series on the Science and Technology of Materials" which will be published by John Wiley & Sons, Inc., of New York City.

Dr. Hollomon, a leading authority on metallurgical research, is manager of the Metallurgy and Ceramics Research Department at the GE Research Laboratory, says, "It is the general plan of this series of books to present the science and technology underlying the behavior and the manufacture and the technical use of all important solid materials."

The series is being designed so the books will meet the needs of university students, younger scientists, and engineers, as well as the more experienced people who may not have had the benefit of the formal courses now coming into university curricula.

The entire series will be divided into three general areas: scientific understanding, applied science, and engineering materials and processes.

In the first area volumes will be prepared on the basic physics and chemistry that pertain to the behavior of solids. Several volumes also will be prepared describing the properties, processes and the use of metals, ceramics and glass, semiconductors and polymers.

Edward J. Siegwarth has been advanced to the post of factory manager of all plant operations for the Leece-Neville Company, Cleveland.

Leece-Neville manufactures a complete line of alternator-rectifier systems, generators, motors and voltage regulators.

Siegwarth was formerly superintendent of the company's Plant No. 1 which manufactures the Leece-Neville line of fractional horsepower motors.

He joined the company in 1942.

Announcement has also been made of the appointment of **Joseph T. Clark** to the post of superintendent of Plant No. 1, and **Robert W. Reichard** as superintendent of Plant No. 2. Both men have been assistant superintendents of their respective plants prior to their present promotions.

Clark has been associated with Leece-Neville since 1951. Reichard has been with the company since 1943, when he joined the firm's production planning department.

Morehead Patterson, president, American Machine and Foundry Company, New York, has been elected chairman of the Nuclear Standards Board of the American Standards Association.

Patterson served previously as chairman of the Planning Committee for Standards in the Nuclear Field, organized from all parties-at-interest under the auspices of the American Standards Association. The committee studied and made recommendations to the Association concerning the need for standards in various operations of nuclear power in industry.

Henry G. Lamb, in charge of Safety and Highway Standards, American Standards Association, was named secretary of the Board.

The following organizations are members of the Nuclear Standards Board: Aircraft Industries Association of America, Inc.; American Industrial Hygiene Association; American Institute of Chemical Engineers; American Institute of Electrical Engineers; American Public Health Association; American Society of Mechanical Engineers; American Society of Safety Engineers; American Society for Testing Materials; Association of Casualty and Surety Companies; Atomic Industrial Forum, Inc.; Bureau of Explosives; Electric Light and Power Group (Association of Edison Illuminating Companies and Edison Electric Institute); Institute of Radio Engineers; International Association of Governmental Labor Officials; Manufacturing Chemists Association, Inc.; National Association of Mutual Casualty Companies; National Electrical Manufacturers Association; National Safety Council; Radio-Electronics-Television Manufacturers Association and the Society of Automotive Engineers.

Also the U. S. Department of Defense; U. S. Department of Health, Education and Welfare; U. S. Department of Labor; U. S. Department of Commerce—National Bureau of Standards and the U. S. Atomic Energy Commission.

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The next time the KLEM man calls at your plant take advantage of his specialized experience and training in metal surface cleaning and preparation. If you have a problem he may be of help to you on the spot, if not he'll use the KLEM-PLAN to present the facts to our lab technicians who will find a quick answer for you.

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WRITE FOR THE KLEM CATALOG, TODAY

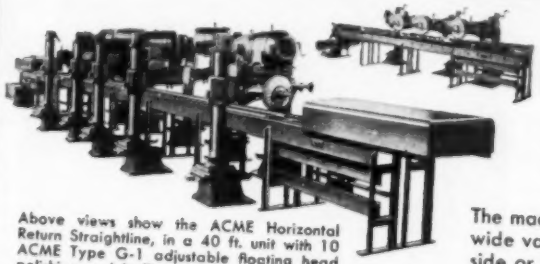
ACME *Automatics* PUT POLISHING *and* BUFFING OPERATIONS *on a low cost production basis . . .*

ACME *Semi-Automatics*

ACME Semi-Automatics are built to "deliver the goods." They can be fully relied upon to cut finishing costs, maintain production levels and stand up under long hours of operation!

The three ACME Semi-Automatics above are from left to right, the ACME A-2, a 2 spindle hand indexing machine for polishing and buffing cylindrical parts up to 12" diameter . . . the ACME L-4, a 4 spindle automatic indexing machine with a normal range of 250 to 400 indexes per hour . . . and the ACME D-10, an oscillating machine for finishing out of round parts. These machines are proved producers.

WRITE FOR CATALOG ILLUSTRATING WIDE RANGE OF TYPES



Above views show the ACME Horizontal Return Straightline, in a 40 ft. unit with 10 ACME Type G-1 adjustable floating head polishing and buffing lathes . . . and a 20 ft. unit with 3 ACME Type G-3 lathes.

ACME *Straight Lines*

ACME Straightlines provide effective solutions to many finishing problems. ACME progressive experience and engineering assure dependable performance at high production levels.

The machine illustrated is unusually versatile and adaptable to a wide variety of work. It may be loaded or unloaded from either side or either end. Polishing and buffing heads may be used on either or both sides and may vary in number to suit the required production and finish.

WRITE FOR OUR STRAIGHTLINE CATALOG ILLUSTRATING OTHER TYPES

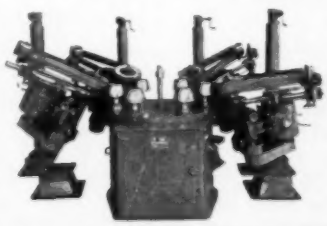
ACME *Rotary Automatics . . .*

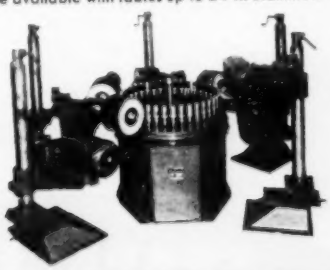
ACME 40" Rotary with 6 station indexing table and 4 ACME Type G-1 lathes with belt arm attachment. One second indexing time . . . up to 1800 indexes per hour. Acme Indexing Rotaries are available in table sizes from 18 in. to 10 ft. diameter.

ACME 10 ft. Combination Rotary . . . for continuous operation using 24 continuously revolving spindles or for 12 station indexing operation using every other spindle. One second indexing time . . . up to 1200 indexes per hour.

ACME 50" Continuous Rotary Automatic with 40 spindles equipped with 4 Acme Type G-3 heavy duty 15 H.P. polishing and buffing lathes with inverted spindles. ACME Continuous Rotaries are available with tables up to 24 ft. diameter.

WRITE FOR ROTARY CATALOG





for POLISHING • BUFFING
GRINDING • MICRO-FINISHING
DE-BURRING • WIRE BRUSHING

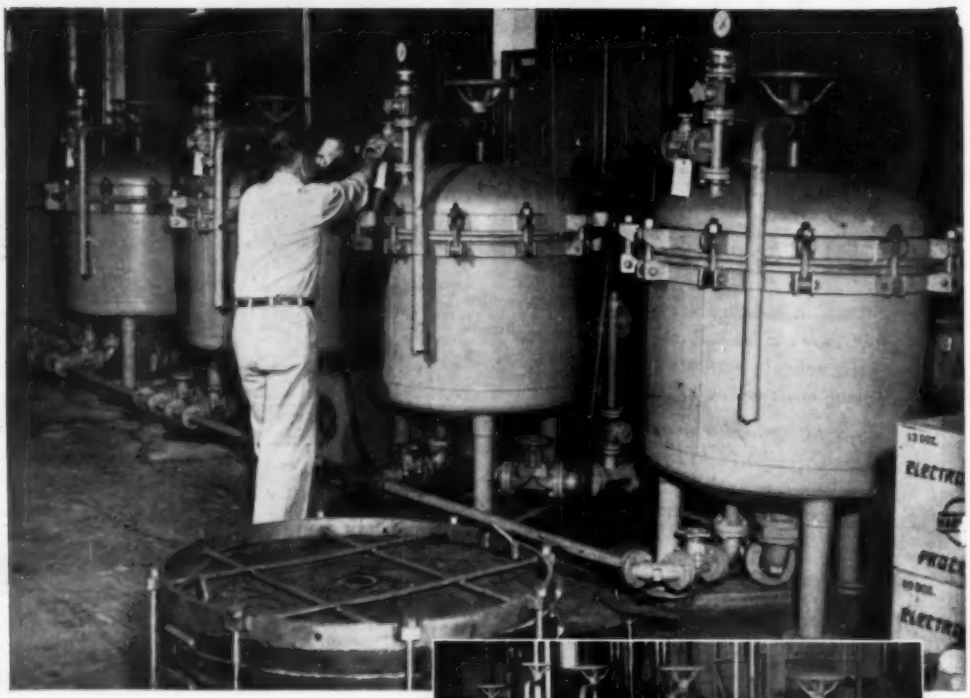
SPECIAL MACHINERY — AUTOMATIC BUFFING MACHINES

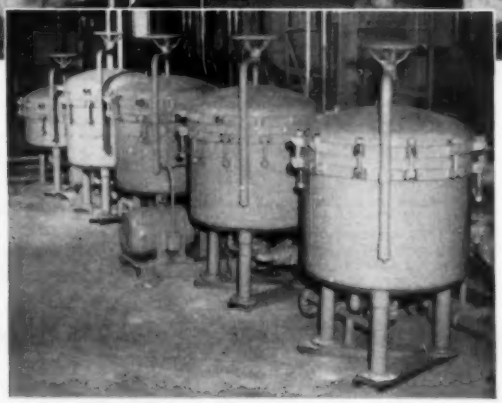
ACME *Manufacturing Co.*

Builders 1400 E. 9 MILE RD., DETROIT 20 (Ferndale) MICH.

OF AUTOMATIC POLISHING AND BUFFING MACHINES FOR NEARLY HALF A CENTURY

FOR FURTHER INFORMATION, USE READER SERVICE CARD; INDICATE A 1123.





High Flow Rates Low Servicing Cost *give* Low Cost Filtering of Plating Solutions–

2,208,000 gals. of bright nickel solution are filtered in these four Sparkler Horizontal Plate filters (top illust.) through a continuous 5 day cycle with 24 hour operation. Filters are cleaned once a week by lifting out the plate cartridge and replacing it with a fresh dressed set of plates. Only a few minutes is required for this operation.

In the same plating plant, (lower illust.) the four large Sparkler filters are used to filter suspended matter from Ronal bright copper solution. These filters have a flow capacity of 4800 G.P.H. each. The small, far end unit filters suspended matter from a copper strike bath. Capacity 2,100 G.P.H.

On occasion these filters are employed for filtering out activated carbon and lime from copper solution and activated carbon and nickel carbonates from nickel solution.

Plating Plant Engineers will find Sparkler filtration engineers most co-operative to work with on installations of any size.
Write Eric Anderson

SPARKLER
horizontal plate
FILTERS
(the original horizontal plate filter)

SPARKLER MANUFACTURING CO. MUNDELEIN, ILL.
Sparkler International Ltd.
Manufacturing plants in Canada, Holland, Italy, and Australia.

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Facts to consider when you're buying

Chromate Conversion Coatings

for Corrosion Protection, Paint Base, Decorative Finishing

WHAT IS IRIDITE®?

Briefly, Iridite is the tradename for a specialized line of chromate conversion finishes. They are generally applied by dip, some by brush or spray, at or near room temperature, with automatic equipment or manual finishing facilities. During application, a chemical reaction occurs that produces a thin (.00002″ max.) gel-like, complex chromate film of a nonporous nature on the surface of the metal. This film is an integral part of the metal itself, thus cannot flake, chip or peel. No special equipment, exhaust systems or specially trained personnel are required.

If your company is manufacturing or buying parts or complete assemblies made from or plated with any of the more common non-ferrous metals—zinc, cadmium, aluminum, magnesium, silver, copper, brass or bronze—you've probably already run up against the question of finishing these surfaces with a chromate conversion coating. These coatings are used to protect against corrosion, or to provide a base for paint or to provide a decorative finish for sales appeal or shelf life. Since chromate conversion coatings represent a relatively new means of obtaining these finishes, this digest of facts to consider may be of value to you.

1. THE COATINGS THEMSELVES. There are many brands on the market. All are similar in many ways. Each, of course, offers its own specific advantages and these may relate to operating techniques, performance under actual use conditions, cost, availability, etc. Naturally, you'll want to choose a coating that is widely known and accepted under both military and civilian specifications.

2. THE COMPANY BEHIND THE PRODUCT. Is it a reliable, established organization? Does it offer experienced technical service, both from the field-engineering organization as well as the home office and laboratories? The man who sells and services your installation should be thoroughly familiar with not only chromate conversion coatings and their applications, but also with the characteristics and performance of related finishing operations such as precleaning, electroplating, painting, etc. This is most important since all steps of the finishing cycle must be functioning properly for the satisfactory performance of the ultimate finish produced.

3. AVAILABILITY OF THE PRODUCT. Ideally, of course, the material should be readily available to you from nearby warehouses to avoid time loss in long distance shipping and to provide emergency service, should the need arise.

4. COST. Naturally, the initial price of the material is important to you. However, just as you consider ultimate cost when you are buying mechanical equipment, ultimate cost must be considered for these finishing chemicals. So, it will pay you to investigate consumption costs, labor costs and the other factors which go into the determination of ultimate cost. Further, cost alone gives no indication of product performance, so careful attention must be given to the purpose the finish must serve and the value that finish will add to your product.

5. FACILITIES FOR RESEARCH AND DEVELOPMENT. Perhaps the existing types of chromate conversion coatings do not include a compound that will accomplish exactly what you wish. Then, it is important to deal with a supplier who has adequate research and development facilities available to work with you to produce a material to meet your needs. Naturally, such a project is seldom completed overnight. But, with complete cooperation and confidence from both you and your supplier, chances are a satisfactory program can be completed.

These are the concepts of sales and service on which we, Allied Research Products, Incorporated, have developed and marketed the line of Iridite chromate conversion coatings . . . superior product performance, complete sales and technical service, easy product availability, economical cost, extensive research and development facilities. No doubt you are familiar with our line and have seen this trademark—

IRIDITE®

—in our advertising, technical literature or on shipping containers in your plant. Remember this trademark when you're buying or investigating chromate conversion coatings for your company. It's your assurance of quality, economical products from a reliable and established company, skilled sales and technical service from both our home office and a national network of representatives, immediate availability from warehouses in strategic industrial areas and our willingness to work with you to develop new finishes to meet your needs, should the present line fall short.

For complete information on Iridite chromate conversion coatings, write today for your free copy of our technical data file. Or, for immediate advice, call in your Allied Field Engineer. He's listed under "Plating Supplies" in your classified telephone book.

ALLIED RESEARCH PRODUCTS
INCORPORATED
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Manufacturers of iridite chromate conversion coatings for corrosion resistance, paint systems, final finishing of non-ferrous metals; ARP Plating Brightener & Chemicals. West Coast Licensee—L. H. Butcher Co.

L—1100. Industrial Waste Treatment Article—Graver Water Conditioning Co. has available copies of Technical Reprint T-145 on "Specifying Industrial Waste Treatment." The paper presents a comprehensive picture of this increasingly important field. There is a discussion of the proper steps to be taken in approaching the problem, the methods of treatment and the types of equipment used to accomplish given tasks. This article will be of interest to engineers in all fields of industry.

L—1101. Precision Tumbling—Slide-Honing—the modern precision tumbling process—is described in a new and revised brochure by the BMT Manufacturing Corp. Metals, plastics, castings, and parts of all kinds previously considered impractical to finish in tumbling machines are now successfully handled by the Multi-Barrel Slide-Honing Unit. The controlled-motion honing does not affect the dimensional tolerances of the pieces, yet removes burrs, flash, tool marks, rust, paint, plating, heat treating scale, and improves color and micro finish of the part.

Companies are invited to send a test sample of 25 pounds or approximately 1 cubic foot of parts by volume prepaid with a desired finished piece. These test parts will be processed to specifications desired and process sheets will be furnished for cost comparisons—all at no cost or obligation.

L—1102. Sprayable Coating—A four-page, photo-illustrated bulletin now available from Metal & Thermit Corp. describes the company's latest development in sprayable plastisols, Unichrome "Super 5300" Plastisol Coating. The bulletin explains how the specially formulated plastisol can be sprayed in coatings up to 60 mils thick in a single application—even to cold vertical surfaces.

According to the bulletin, "Super 5300" Coatings protect against a wide range of acids, alkalies, salt solutions and complex chemical compounds. They are of particular benefit in protecting tanks, chemical vessels and similar equipment that can not be dip coated economically.

L—1103. Abrasive Finishing—A new 10-page booklet illustrating how several leading appliance manufacturers are cutting costs and improving finishes with 3M coated abrasives in various forms is available free from Minnesota Mining and Manufacturing Co.

Entitled "Grinding and Polishing Appliances with 3M Coated Abrasives," the booklet makes case history presentations of several abrasive operations, including prefinishing, weld grinding and blending, removing imperfections, and finishing and polishing. Types of coated abrasives illustrated in use are belts, sheets, discs and "PG" (polishing and grinding) wheels.

L—1104. Suggestions for Barrel Finishing—A folder describing barrel finishing methods and materials has recently been published by Oakite Products, Inc.

The folder is designed to give metal fabricators an over-all view of the problems and requirements inherent in this fast-growing method of finishing metal. The subject is discussed from precleaning to final rinse. Knowledge gained from actual in-shop experience is applied to the use of cutting and descaling solutions, picking the right finishing materials, alkaline vs acid type compounds, burnishing solutions, water levels, and media-to-work ratios.

In addition, the folder discusses the barrel finishing materials recommended for the various procedures. It explains, for instance, why an alkaline, abrasive material is suggested for deburring stainless steel; how a recently developed rinsing aid helps prevent water spotting on finished surfaces, and gives temporary rust protection.

L—1105. System Conserves Heat—A new 16-page catalog by Jensen Specialties, Inc. explains the latest techniques used in modern process heating, including a highly successful method of combining radiation with convection. Jensen points out that the catalog should be particularly informative to companies interested in a quick, easy-to-understand knowledge of modern heating systems.

In 16 pages of photos, diagrams and text, Jensen shows how the latest in heating and conveyor systems offer (1) utmost safety due to proper exhaust of solvent laden atmosphere, (2) high output of energy (BTU's), (3) greater conservation of heat energy, (4) precisely controlled heat distribution, and (5) painting and drying of large or slow drying products in minimum space.

The booklet, called "A Modern Advanced Approach to Process Heating" covers in detail, applications of booster ovens and complete systems, including information on panel segments, wiring channels and conveyors. A series of photo-stories show these parts in a variety of applications.

L—1106. Chromium Plating Additive—A new, informative fact-file folder concisely reviewing a recently developed chromium plating additive for both decorative and hard-chrome applications has just been issued by the Chromium Chemicals Division of Diamond Alkali Co.

Printed in three colors on cover bristol paper stock with a 1/8-inch score for conveniently filing technical service bulletins and related data, the four-page folder briefly describes "CPA 1800." It outlines how and why this Diamond development contributes to faster chromium plating, broader operating range and greater covering power of chrome-plating baths, brighter and harder deposits, and easier anoding in hard-chrome plating.

Supplementary technical data, presented in either convenient chart or graph form, covers composition of both decorative and hard-chrome plating solutions using this additive, range of bright chromium deposits obtained, and effect of current density on plating speed of such baths.

L—1107. Detergent-Action Safety Solvent—A new four-page folder describing Turco-Solv, a true detergent-action safety solvent, has been issued by Turco Products, Inc.

The folder states that while Turco-Solv is designed primarily for the in-place cleaning of electrical equipment, it is also ideal for the hand wiping of small parts, for precleaning prior to flaw detecting operations, for grease pencil, chalk or ink removal, as well as a host of other cleaning jobs incident to plant maintenance.

The compound is non-conductive, evaporates to complete dryness without leaving a residue, requires no rinsing, and is safe on all metals, paint and varnishes.

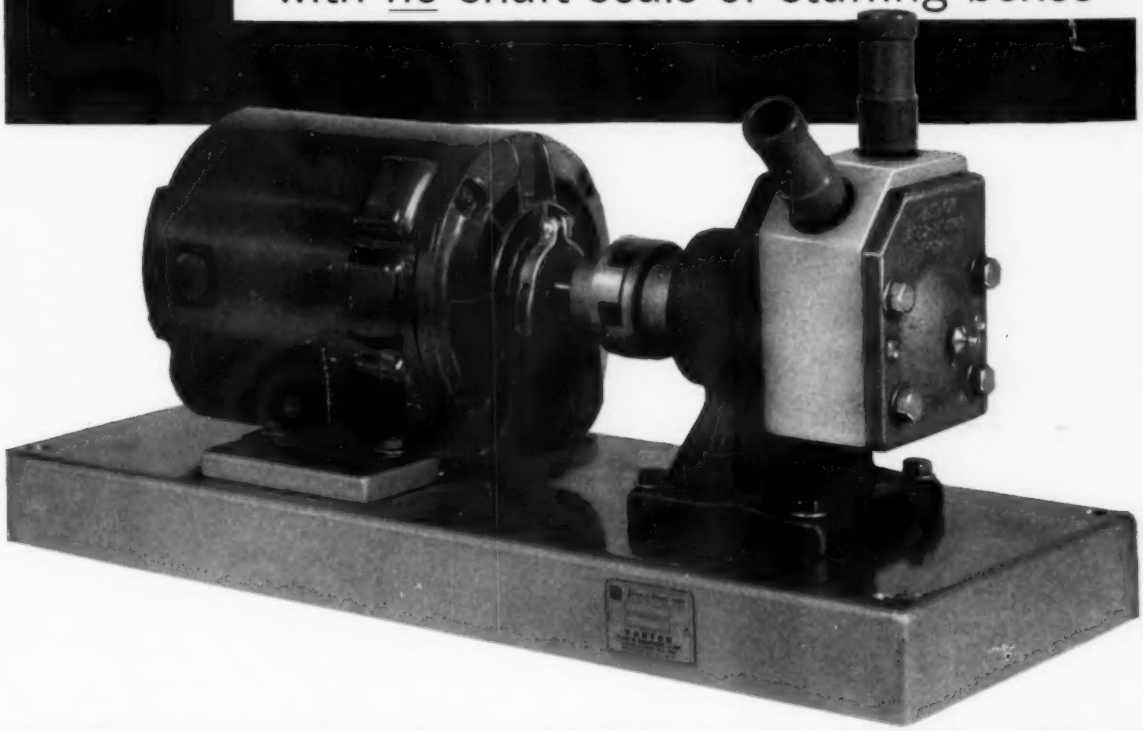
The folder contains three charts which cover toxicity, flash point throughout evaporation cycle and evaporation rate of Turco-Solv as well as other commonly used cleaning solvents. Also included are a number of established uses for safety solvents.

L—1108. Paint—Publication of a new Paint Manual, Tygon Coatings Bulletin No. 760, is announced by The U. S. Stoneware Co. This new manual is designed for use as a practical work book, presenting useful painting data in the form of charts, tables, diagrams and illustrations. Virtually all factors relating to the use of Tygon Protective Coatings in mild to severe corrosive service are covered in detail.

the VANTON Plastic "Flex-i-liner" pump

the only (repeat-ONLY) plastic rotary pump

with no shaft seals or stuffing boxes



Costly leakage and metal contamination are no longer problems

. . . for here is a pump truly designed for the plating industry. The unique "flex-i-liner" design eliminates stuffing boxes, shaft seals, gaskets or check valves. Fluid contact is limited to the inner surface of a plastic housing and outer surface of a durable plastic or synthetic flexible liner.

"Flex-i-liner" pumps are ideal for handling such plating solutions as: Brass, Cadmium, Copper, Gold, Nickel, Rhodium, Silver and Zinc, as well as Chromic, Hydrochloric, Sulfuric and other acids found in plating rooms.

Self priming with a gentle, non-shearing pumping action, Vanton "flex-i-liner" pumps are available in capacity ratings from ⅛ to 20 gpm and can be furnished direct connected to constant or variable speed motor equipment. Vacuums up to 26" Hg. are developed.

HOUSINGS: Available in Polyethylene, Buna N, PVC, Bakelite.

LINERS: Available in Neoprene, Buna N, Gum or Natural Rubber, Hypalon, Vinyl or Compar.

Bulletin VP563 on request.

VP

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PUMP & EQUIPMENT CORP.
division of Cooper Alloy Corporation **HILLSIDE, N.J.**

L—1109. Drum Rotators—Ways to cut mixing, blending, tumbling and cleansing costs are featured in the new Morse bulletin 355. The bulletin describes six major models of the complete portable and stationary drum rotator line, manufactured by the Morse Manufacturing Company, Inc. The models range up to a 2000 pound capacity stationary double drum rotator.

L—1110. Brush Finishing—Getting double duty from centerless grinding machines is explained in a new, four-page brochure, illustrated with photographs and a brush specifications chart. In it, the Osborn Manufacturing Co. tells how to reduce downtime on centerless grinders by extending their use to precision brush finishing on cylindrical parts. Types of finishing possible, and characteristics of brushes needed, are described.

L—1111. Plating Test Equipment—A new eight-page brochure describing "ROHCO Test Equipment For Plating Baths" has recently been released by R. O. Hull & Co.

Of particular interest to production platers and methods engineers is the complete line of instruments and accessories for laboratory and plating tank testing.

Among the ROHCO devices described are Hull Cell miniature plating test units for control of plating baths; Hull Cell Anodes and Cathodes; Hanging Hull Cell for making Hull Cell plating tests under production conditions; Electric Hull Cell Agitator, for reproducing tank operation; Rectifiers for Hull Cell tests; Currentester, for detecting and correcting hidden troubles of rectifiers to maintain highest quality production, etc.

L—1112. Blasting—A series of a fully illustrated folders describing in detail a variety of applications for the pressure blast wet blasting process are available from the Cro-Plate Company, Inc., Hartford, Conn. The material deals with deburring, selection of abrasives, finishing of molds and dies, honing cutting tools, carbide inspection, cleaning prior to electroplating, aircraft engine overhaul cleaning.

L—1113. Mechanical Finishing Machine—A new semi-automatic polishing and buffing machine is offered by Oswald Mfg. Co. of Long Island. It is a low-priced machine readily adaptable to either short-run or long-run production on economical basis. It is reputed to give all the motions of high-priced automatics and yet requires but five minutes of set-up time from job to job.

L—1114. Recording and Controlling Instrumentation—"A new approach" to recording, indicating and controlling instruments required in industrial processing, is described in a four-page bulletin published by Fielden Instrument Division of Robertshaw-Fulton Controls Company.

The new bulletin describes instrument systems of unparalleled simplicity and flexibility. These systems feature four basic components that can be interchanged to perform a variety of functious, as well as minimize maintenance problems.

L—1115. Pillows—A new one-page catalog sheet, illustrating its newly developed polyethylene pillows which reduce evaporation of liquids in open vessels up to 70 per cent, has just been published by the American Agile Corporation.

The free literature points out that the pillows are in essence, small floating tank covers, 1.1 pound of which cover 1 square foot of surface area with a 1½ inch thick layer.

Applicable to almost every industry to increase the service life of the solutions, the pillows have virtually unlimited life, are chemically inert to almost all reagents, are light in weight, low in cost, and are non-contaminating. They are ⅝ inch od by 1¼ inches by ¼ inch. Both ends are sealed after air has been introduced for added buoyancy.

L—1116. Standards—This booklet describes the three ways standards become nationally-accepted and approved as American Standards. Tells who makes these American Standards and why, and who uses them.

Explains why the American Standards Association is, how it guards the democratic processes through which American Standards are developed, and how it operates impartially for the manufacturer, the consumer and the general public.

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Get *fast, uniform* deposits with Hussey quality anodes. Manufactured to exacting specifications, Hussey Plating Anodes are available in a full range of sizes and shapes to suit any requirement. Order from the Hussey Warehouse nearest you.

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Revised specifications and tests for electrodeposited metallic coatings Free, (through the courtesy International Nickel Co.)

STANDARDS RELATING TO ELECTRODEPOSITED METALLIC COATINGS

A 164 – 55.	Spec. for Electrodeposited Coatings of Zinc on Steel
A 165 – 55.	Spec. for Electrodeposited Coatings of Cadmium on Steel
A 166 – 55 T.	Spec. for Electrodeposited Coatings of Nickel and Chromium on Steel (Tentative)
A 219 – 54.	Methods of Test for Local Thickness of Electrodeposited Coatings
B 117 – 54 T.	Method of Salt Spray (Fog) Testing (Tentative)
B 141 – 55.	Spec. for Electrodeposited Coatings of Nickel and Chromium on Copper and Copper-Base Alloys
B 142 – 55.	Spec. for Electrodeposited Coatings of Nickel and Chromium on Zinc and Zinc-Base Alloys
B 177 – 55.	Rec. Practice for Chromium Plating on Steel for Engineering Use
B 183 – 49.	Rec. Practice for Preparation of Low-Carbon Steel for Electroplating
B 200 – 55 T.	Spec. for Electrodeposited Coatings of Lead on Steel (Tentative)
B 201 – 55 T.	Spec. for Chromate Finishes on Electrodeposited Zinc, Hot-Dipped Galvanized, and Zinc Die-Cast Surfaces (Tentative)
B 242 – 54.	Rec. Practice for Preparation of High-Carbon Steel for Electroplating
B 252 – 53.	Rec. Practice for Preparation of Zinc-Base Die Castings for Electroplating
B 253 – 53.	Rec. Practice for Preparation of and Electroplating on Aluminum Alloys
B 254 – 53.	Rec. Practice for Preparation of and Electroplating on Stainless Steel
B 281 – 53 T.	Rec. Practice for Preparation of Copper and Copper-Base Alloys for Electroplating (Tentative)
B 287 – 54 T.	Method of Acetic Acid-Salt Spray (Fog) Testing (Tentative)

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By P. Morisset
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(Cents per lb, f o b at point shipped)

Above prices in effect October 4, 1956

● The Office of Defense Mobilization has authorized an additional diversion to industry of 5,000,000 lbs of nickel which had been scheduled for the government during the fourth quarter of this year. This brings the total diversions for the fourth quarter of 1956 to 25,000,000 lbs, bringing the diversions for the year to over 79,000,000 lbs.

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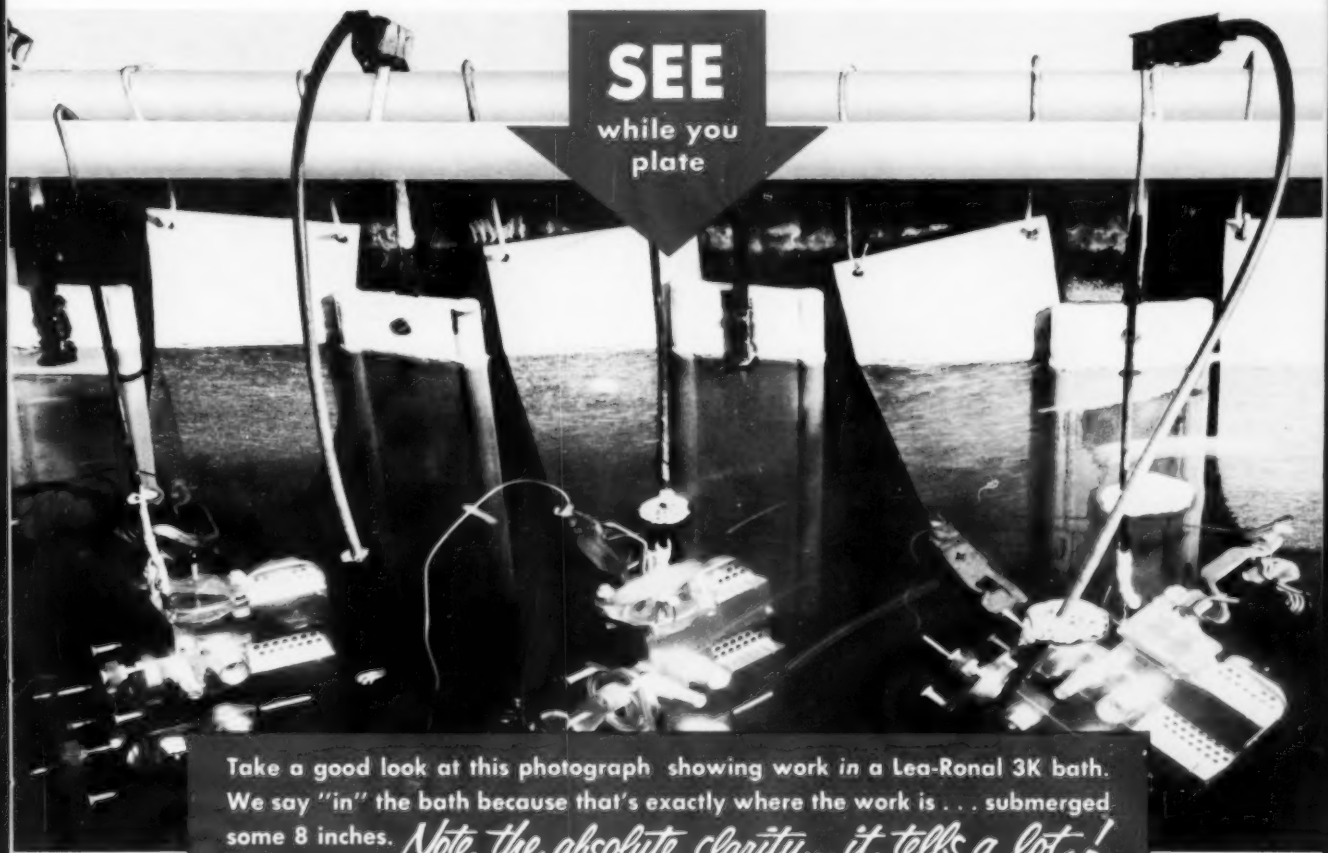
LEA-RONAL 3K BRIGHT SILVER



Take a good look at this photograph showing work *in* a Lea-Ronal 3K bath. We say "in" the bath because that's exactly where the work is . . . submerged some 8 inches. *Note the absolute clarity... it tells a lot!*

Lea-Ronal 3K is a colorless crystal clear bath. It gives the operator that added advantage of visual control during the deposition of silver. But clarity of solution and brilliance of deposit are not the only values offered to the users of Silver-Glo.

- **rapid deposition because of the ability to operate at high current densities (0-60 ASF Hull Cell)**
- **harder deposits and greater wear resistance without sacrifice of ductility**
- **high tarnish resistance of the silver deposit**

If you're in silver, why not investigate this well-proved Lea-Ronal 3K Bright Silver Process? You can easily convert from any conventional bath. You can use it either in barrels or tanks. In writing for detailed information, outline your present operations and objections.

PRODUCTS OF L·R RESEARCH — DEVELOPERS OF ELECTROCHEMICAL PROCESSES

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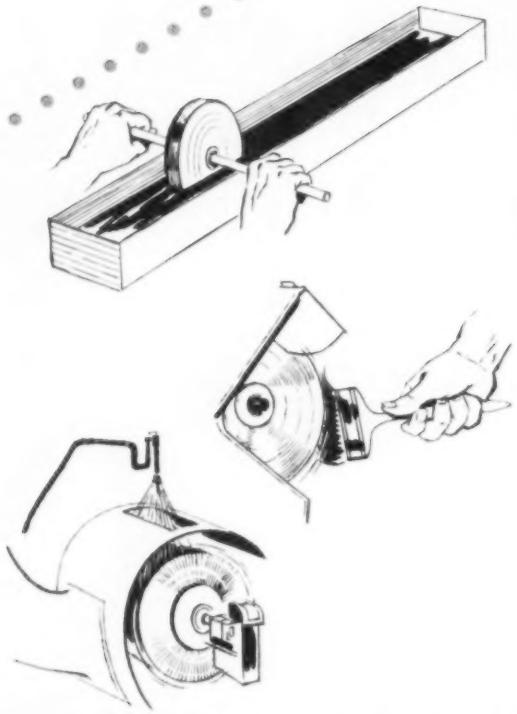
Plating Polishing Buffing Burring

Are you interested in Buffing, Polishing and Burring Specialties? SEE THE OTHER SIDE OF THIS INSERT.

Two Liquid Abrasive Compositions

For Polishing Operations



We now are offering a complete engineering service—layout, equipment, supplies—for liquid polishing and buffing operations.

LEA PLASTI-BRADE · · ·

a flexible liquid abrasive polishing composition carrying the finer grit sizes.

LEA PLASTI-GLUE · · ·

a flexible liquid adhesive for setting up polishing wheels.

The marked success of LEA LIQUABRADE in *liquid* buffing operations led our technical staff straight into the important field of polishing and burring with liquid compositions. First came LEABRAMENT designed for liquid polishing operations in the medium to coarse grit range.

Paralleling these two are LEA PLASTI-BRADE and LEA PLASTI-GLUE, both designed for use with the finer grits for flexible polishing operations. PLASTI-BRADE is a non-flammable, stable, non-settling *liquid* polishing composition in combination with grits ranging from 120 to 320. PLASTI-GLUE, also non-flammable and stable, is a liquid adhesive for setting up polishing wheels in the finer grit sizes. Both liquids can be sprayed, brushed or rolled. Both come in 30 to 55 gallon drums, 5 gallon pails, or gallon cans. Place a trial order today for enough to make a thorough test. If you want our recommendation as to proper grit sizes, etc., write in detail about the kind of work involved, operational steps, and end-finish desired.

Burring, Buffing, Polishing, Lapping, Plating and Spray Finishing . . . Manufacturers and Specialists in the Development of Production Methods, Equipment and Compositions. Manufacturers of Leo Compound and Learok . . . Industry's quality buffing and polishing compounds for over 30 years.

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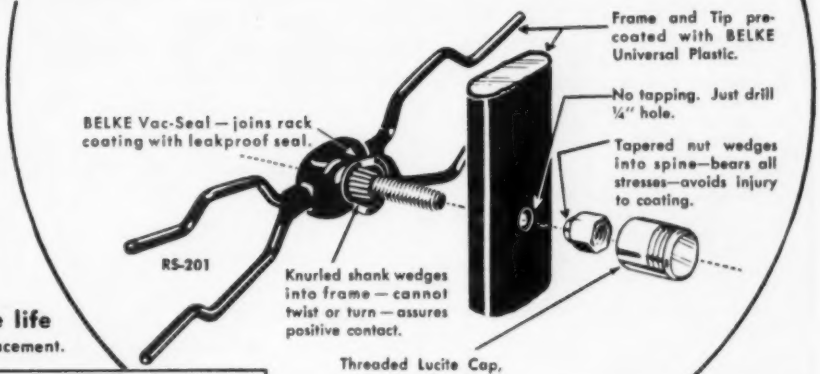
They are ALL turning to BELKE Thinker Boy

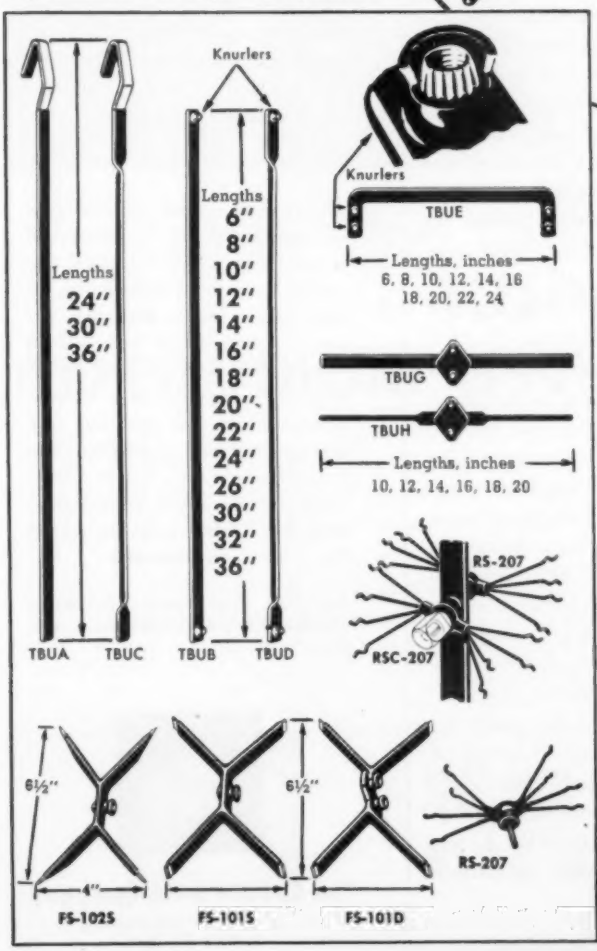
For lowest overall racking costs
Achieved through long life, adaptability and re-use factors.

For efficient "new job" racks in jig time
Assembled from stocks of Thinker Boy Rack Members and Tips.

For full rack capacity through tremendous use life
By convenient "on the job" tip replacement.


Frame and Tip pre-coated with BELKE Universal Plastic.
No tapping. Just drill ¼" hole.
Tapered nut wedges into spine—bears all stresses—avoids injury to coating.
BELKE Vac-Seal—joins rack coating with leakproof seal.
RS-201
Knurled shank wedges into frame—cannot twist or turn—assures positive contact.
Threaded Lucite Cap, encloses stud and nut—screws against rack coating and seals solution out.

You can be ready to plate in minutes



With Thinker Boy you can assemble racks you design for the job when you need them—no delay—no waiting.

You can make single, double, and triple spine, cross bar and tee racks, with endless variations and in a wide range of dimensions.

What's more—you can replace broken tips in a jiffy—keep Thinker Boys at full capacity

When a Thinker Boy Rack is no longer needed you can install tips to rack other work or disassemble and re-use the members in new racks.

For low cost,
ready made, mass produced, rigidly assembled all copper, plastisol insulated racks send for BELKE Economy Rack Bulletin.

Just think! With Thinker Boy Parts you can assemble a sample rack to fit the actual work in a few minutes. Have definite figures for estimating costs. Be in production in a few hours.

Send for the Thinker Boy Bulletin. See the many different rack styles you can assemble and the great selection of Thinker Boy Tips available.

Acquaintance with Thinker Boy opens up a big field of opportunity for reducing costs.

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1—750 AMPERE, 60 VOLT, **HANSON-VAN WINKLE-MUNNING**, Synchronous, Exciter-in-head.

1—500 AMPERE, 25 VOLT, **CHANDEYSSON**, Synchronous, Exciter-in-head.

4—400 AMPERE, 40 VOLT, Separately Excited.

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1—TOLLHURST CENTRIFUGAL DRYER, 20" dia. basket, with Steam Heat

1—H-VW-M Full-Automatic Plating Machine, 87' long, 39" lift, was used for chrome.

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2—**RONCI** Enamelers, No. R-100 and No. R-200.

1—MODEL "A" PRESSURE BLAST.

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COVER STORY

Coating Brightness

Virtually all conditions and factors in a plating process influence the brightness of the deposited coating. Research into the mechanism whereby each factor influences the brightness is hampered by the lack of fundamental knowledge as to just what the structural difference is between a bright deposit and a dull deposit.

The highly magnified electron photomicrographs on the cover illustrate the structural alterations wrought by a certain organic addition agent in a nickel plating bath. With no addition agent present, the deposit was dull, and large, well-developed crystal surfaces appear. As the addition agent concentration is increased, the deposit is brighter, and substructure becomes visible on the surfaces of the larger crystal faces. At still higher concentrations, the finer type of structure dominates.

In this and other similar examples studied, the enhanced brightness as caused by the addition agent is accompanied by, if indeed not caused by, increasing surface smoothness. Whether this is the basis of a more general difference between a bright deposit and a dull one cannot, of course, be ascertained solely from this type of observation.

The picture is presented through the courtesy of Robert B. Fischer and Charles E. Ring of Indiana University. Their paper, "Addition Agents in Nickel Plating" appears in this issue.

The abbot and the Bishop's Candlesticks

The Bishop was upset. How could he possibly have 500 dull, tarnished brass candlesticks polished and gleaming in time for tomorrow's special candlelight services?

The *abbot* was quite calm. He *knew* the answer to the Bishop's dilemma and in less than twenty-four hours, he returned from his laboratory with the candlesticks — bright and glistening.

How did he do it?

Articles made of brass and other metals may be readily burnished and tumbled with Abbott Burnishing Materials. Made in six scientifically designed shapes, Abbott Burnishing Materials make efficient and uniform contact on metal parts and castings of every conceivable size and shape. Economical to use, they are *deep hardened* and have a mirrorlike glass-hard surface for extra long life. Combined with the Abbott Vertical Tumbling Barrel, they make the perfect barrel finishing combination.

Just off the press! Newest Abbott catalog of tumbling barrels and tumbling media. Write for it!

ABBOTT

The ABBOTT BALL Company

1054 New Britain Avenue
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Sulfur: less than 1 part per million

in KOPPERS POTASSIUM CYANIDE SOLUTION

Sulfur is the culprit in cyanide plating. And in some solid types of potassium cyanide, sulfur content *can be in the hundreds* of parts per million.

Koppers KCN solution, on the other hand, has *less than one part* per million. As a result, you get brighter finishes and *fewer rejects* when you use Koppers KCN solution.

OTHER ADVANTAGES OF KOPPERS KCN SOLUTION include easier and *safer* handling. Send for free descriptive bulletin which contains complete facts. Or call any Koppers Sales Office. Koppers Company, Inc., Dept. P-116, Chemical Division, Pittsburgh 19, Pennsylvania.

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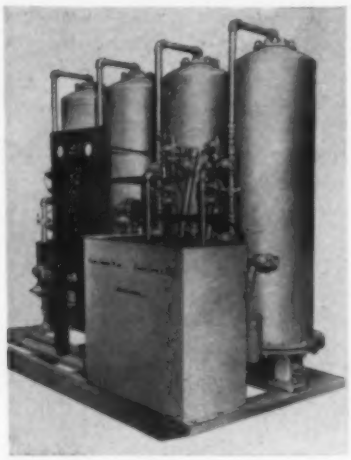
FOR FURTHER INFORMATION, USE READER SERVICE CARD; INDICATE A 1131.

Equipment and Supplies

Use the convenient Reader Service Card on page 32C to obtain additional information on any of these items



E—1117. Automatic Multi-Column Demineralizer—A new, fully automatic LA-1000 unit, which operates on multi-column ion exchange principles is announced by Penfield Manufacturing Company. It passes the raw water through four columns; two each, alternately, of cation and anion resins. The third and fourth columns remove the more weakly ionized impurities that may have passed through the first cation and anion columns. Thus effective removal of free CO_2 and silica is said to be accomplished and an effluent of exceptionally high purity provided.

All operating functions are automatic. When the effluent's purity falls below the desired standard originally set by the operator, the unit automatically stops delivering treated water and the need for a regeneration cycle is signalled. The regeneration cycle is initiated by setting one switch and completes itself entirely automatically, including rinsing and re-cutting in the effluent when the pre-set standard or purity is attained.

Regenerant piping includes non-corrosive eductors, non-corrosive valves, and plastic draw-up lines for both acid and caustic regenerants. Process piping is 150 lb bronze pipe for all raw water lines, stainless steel or plastic on all effluent lines.

E—1118. Small Parts Polishing Lathe—A new high speed polishing lathe with shortened spindle, for hand finishing small parts, is announced by Hammond Machinery Builders, Inc.

The new lathe, designated as Model 5-ROL uses a 5 hp motor and has a speed up to 6500 rpm instead of the conventional lathe speeds of from 1400 to 3600 rpm.

The new model has dynamically balanced, ball bearing spindle, with either flat or multi-V-belt drive, and motor mounted inside heavy cast iron base. Drive belts are easily removable and can be replaced without removing or exposing bearings. The unit has a combination brake and switch, operated by a single lever for instantly stopping lathe spindle and cutting off motor current before brake is applied. Brake also locks spindle for wheel removal. Overhanging base permits handling of parts without base interference.

E—1119. Uniform Dye—A new dip-dye specifically developed for the metallizing industry by Schwartz Chemical Company, Inc., gives permanent color stability.

The new formulation is called Metallizing Dye and culminates more than 10 months of research and testing.

Because it is a clear dye solution with no sediment or precipitated dyestuff it requires no stirring or rolling even though it is packed in 55-gallon drums. The colors—brass, gold and copper—are extremely stable and will show no variation from the first gallon to the last few drops as it is used in the dip tank, according to A. A. Schwartz, chief chemist.

Of importance to metallizers is the fact that there is no water spotting as a result of the final washing operation. In addition, the color does not bake out when used on metals at high temperatures.

E—1120. Rectifier with Current Reversal—A combination selenium rectifier rated at 100 amps, 0–6 volts dc with periodic current reverser has been developed by Rapid Electric Company.

This model measures 19 inches x 22 inches x 18 inches and combines a standard, full control plating rectifier with periodic current reversal.

As a dual purpose unit, it saves space and installs easily. Designed for requirements which call for exceptionally uniform plating deposits, periodic current reversal, changes the direction of the plating current in the tank at regular intervals, removing deposits from higher and imperfectly adhering areas.

Results are brighter, smoother finishes, requiring little polishing or buffing.

Periodic current reversal is independent of the plating rectifier and both can be used separately. Simple switching reverts PR to normal plating.

E—1121. Masking Tape—Commercial availability of a new high-temperature crepe masking tape, identified as Number 102 Behr-cat, is announced by Behr-Manning Co., a division of Norton Company, after thorough laboratory and field testing.

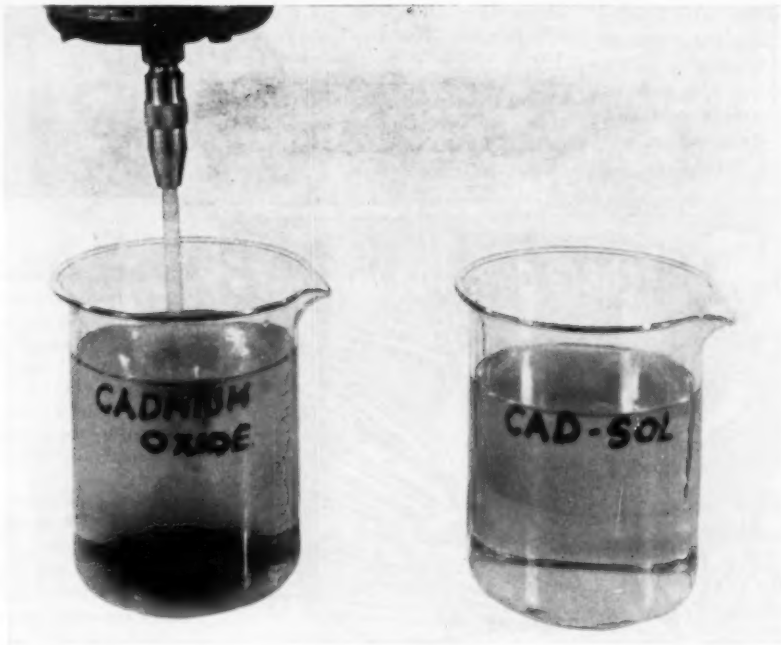
The quick stick, adhesion and easy unwind properties of this low-cost pressure-sensitive tape recommend it for general purpose use in a wide variety of masking operations, with the added feature that it will resist temperatures of at least 275° F for one hour. This versatility is expected to simplify inventory requirements for users who may have been stocking two or more types of tape.

Tensile strength is 20 lb per inch of width; elongation is 13.5 per cent. Of 9-mil gauge, it has an adhesion to stainless steel of 33 oz per in. of width. It is made in a full range of widths from ¼-inch upward, and is bulk packaged in standard cartons.

E—1122. Metallic Copper Dispersion—A new 'dag' dispersion, Number 235, a colloidal dispersion of metallic copper in a lacquer solution that provides a highly conductive surface coating has been introduced by Acheson Colloids Company. The new dispersion is suggested for printed circuitry, electroplating of non-conductors, and for application on components for such products as radar equipment, hearing aids, and electronic measuring devices.

Application of 'dag' Dispersion Number 235 may be by spray or brush with dilution in the ratio of two parts of the product to one part of thinner for spraying and only a slight dilution of the concentrated material for brushing. A stiff brush should be used since a soft brush will permit the copper to settle to the under-side of the film, leaving an excess of lacquer on its surface. Dip coating is not recommended. No baking is required. The film will air-dry and can be handled within a few minutes. Adhesion may be improved by mechanical pre-treatment (vapor-blasting, sand-blasting, etching, etc.) where necessary.

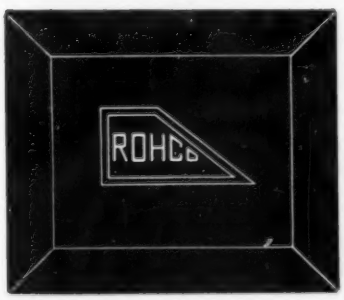
IF You Plate In Beakers You Don't Need CAD-SOL (BUT...TRY TO DISSOLVE 50 POUNDS OF CADMIUM OXIDE IN A PLATING TANK!)



CAD-SOL is a highly concentrated cadmium solution containing 1½ pounds of cadmium per gallon. With CAD-SOL you can add cadmium to your bath as easily as you can add water. CAD-SOL is ideal for making up new baths as well as for maintenance.

CAD-SOL will save you time, labor and money!

R. O. HULL & COMPANY, INC., 1302 Parsons Ct., Rocky River 16, Ohio



JUST PIN THIS COUPON TO YOUR LETTERHEAD

R. O. HULL & COMPANY, INC.
1302 Parsons Court
Rocky River 16, Ohio

RUSH complete information on CAD-SOL!

Name..... Title.....

Company.....

Street Address.....

City..... Zone..... State.....

EQUIPMENT & SUPPLIES

E—1123. Scale Remover—Enthone, Inc. has announced the availability of a new product, Alka-Deox® 109, for the electrolytic removal of scale and oxides from iron and steel. The product is said to remove scale quickly with no chemical attack on the iron or steel because of the alkaline nature of the chemical.

Alka-Deox® 109 is the third product to be produced by ENTHONICS® research in Enthone's line of alkaline scale and rust removers. It is said to be particularly adaptable to plating lines and automatic equipment involving alkaline or alkali-cyanide plating solutions. In such installations, no acids are required and, therefore, equipment corrosion from acid fumes is completely eliminated.

Alka-Deox® 109 can be adapted to present equipment without difficulty and, when planned for new equipment, it can substantially reduce the equipment costs. It is quite suitable for use in barrel plating lines.

E—1124. Stripper—R and P Stripper No. 27, a highly concentrated new type alkaline rust and paint remover, has been developed by the Metasurf Corporation. In announcing this product much stress has been placed on the possible savings to be effected in plant space, time and money. Uniquely, it can remove paint, phosphate coatings, rust, oil and other soils in a fast "One Step" operation. It may be used in ordinary mild steel equipment and greatly reduces the number of operations normally required to obtain clean, rust-free metal surfaces. Unlike pickling solutions, it does not give off any obnoxious corrosive fumes.

It's still around, Sonny, but you can't see it. It's broken up too fine.

That's the way it is with oil, grease, drawing compounds, stamping compounds, and other soils removed from metal parts in a tank of . . .

Cowles NS SOAK CLEANER

No Scum on the cleaning tank to foul cleaned metal coming out. Clean it with Cowles NS Soak Cleaner and it *stays* clean.

For more information about the emulsifying power of Cowles NS Soak Cleaner for *soak-tank* cleaning before plating, enameling, other finishing . . .

Send this coupon for Technical Bulletin.

Cowles Chemical Company
7018 Euclid Avenue
Cleveland 3, Ohio
Please send Cowles NS Bulletin

Name_____
Company_____
Address_____
City_____ State_____

Cowles CHEMICAL COMPANY
Cleveland 3, Ohio

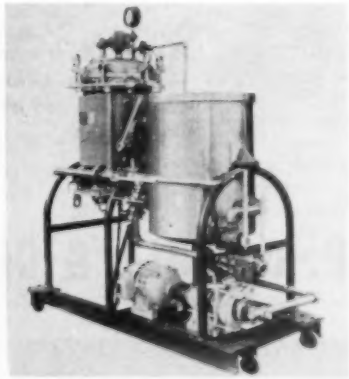
See Cowles NS and QC advertisements on pages 1302 and 1374.

E—1125. Stainless-Steel Spatula—A new general-purpose laboratory tool, based on spatulas in use in the DuPont Experimental Station at Wilmington, is now available.

The Fisher ChemiScraper is a large, tough stainless-steel spatula for breaking up chemicals in large bottles and jars, cleaning reaction kettles, and other laboratory tasks.

The ChemiScraper is made from a single piece of 18-8 stainless, highly polished, and can be used with all but the most powerful reagents without corroding.

The spatula is ground thin at both ends. One end is square, the other rounded.



E—1126. Filter—The Duriron Company, Inc. introduces a completely new stainless steel Durco-Enzinger filtration station as a portable package unit. The station is ideal for pilot plant or other small batch operations.

The complete unit consists of a vertical leaf pressure filter with 21.2 square feet of

Want fast action?
Ride with us!

Ship us your

NICKEL PLATER'S SCRAP

For prompt quotation send us a 5-lb. representative sample of your accumulation.

Invoice us for sample . . . or we will pay on basis of laboratory analysis.

Phone . Wire . Write

Stainless Steel Corp. of America

OHIO EDISON BLDG. YOUNGSTOWN 3, OHIO

RIverside 4-4123

leaf area, a precoat and slurry tank, pump, valves, and complete piping, all mounted on a portable frame. The unit can be positioned and in operation in minutes.

The filter is an Enzinger Model DS 18/21.2 with either wet or dry cake discharge of filter cake. It incorporates a tailings leaf to completely filter the liquid heel. The filter shell is steam jacketed to further increase the versatility of this packaged unit.

E—1127. New Sisal Buff—Three buffing assets, extra flexibility, longer wear and cooler running, in demand by metal finishing plants, are now available in a single buff: the new centerless open bias sisal buff, manufactured by American Buff Company.

The best features of both bias sisal and bias cloth have been combined with American Buff's patented "centerless" construction. The result is an "air-cooled" buff with a "ruffled" face that eliminates troublesome streaking and permits fast cutting with high lustre finishing of flat, curved or contoured surfaces.

The new buffs are made of top-grade, bias-cut sisal fibres, locked together by American Buff's exclusive Permanizing process which eliminates frayed ends and scratching. Centerless Lok-Tite steel rings hold buff units securely in place. The design permits locking together an almost unlimited number of buff sections. The user can build up a buffing face width of 12 inches or more with complete safety. The complete buffing head can be changed in seconds.

E—1128. Ductile Nickel Process—The newly-designed auto side-view mirrors present the problem of how to "draw" or fit the edge of the frame around the mirror without cracking the nickel finish with which the frame has been coated.

Yankee Metal Products of Norwalk, Conn., which manufactures the Pace Setter mirrors, has solved the problem by plating the frames with a bright nickel

process called Nickel-Lume. Developed by Hanson-Van Winkle-Munning Co., Nickel-Lume finishes have proven to have exceptionally good ductility and controlled stress—characteristics which minimize or eliminate problems of crazing, cracking and brittleness that are often encountered by mirror manufacturers.

Use of this process has also minimized rejects and permitted the company to use a heavier nickel coating—with more corrosion resistance—on the mirrors without danger of cracking.

Besides high ductility in H-VW-M's new Nickel-Lume and Levelume processes, they are reported to have "full" brightness, and exceptional plating speeds. Existing facilities can be converted to the new processes without any changeover of equipment.

E—1129. Hand Cleaner—New, waterless, liquid cream hand cleaner has been developed by American Detergent Co., Inc. Most difficult stains such as gentian violet, iodine, hektograph, marking and printing inks, dyes, mastics, grit, grime, carbon are but a few foreign matters that are quickly and efficiently removed from the skin.

This multiple action hand cleaner incorporates special skin conditioning lubricating oils and lanolin as well as hexachlorophene a healant and antiseptic, yet possesses the mildness of fine facial soap.

This man is helping cut small parts drying time just about one-half...

Model 20 New Holland

KREIDER

Centrifugal Dryer

AIR-DRIES...as it SPIN-DRIES!

Now you can *spin-dry* small parts in continuous *fresh air* in as little as 15 seconds . . . cut drying time *just about one-half*.

Double-action drying gives you smooth moisture-free surfaces . . . reduces your finishing problems by eliminating the scarring and marring frequently responsible for costly "rejects."

Speed production . . . cut costs way down with New Holland's easy-to-run Model 20 Kreider Centrifugal Dryer.

Choose from 3 models engineered to meet your requirements: — Standard Model; Standard Model with Supplementary Electric Heat; Standard Model with Supplementary Steam Heat.

— SPECIFICATIONS: —

1 h.p. motor—220, 440, 550 volts—2- or 3-phase—spins 75 lb. loads at 825 r.p.m. . . . Quiet V-belt drive . . . 30-blade suction turbine draws air through spinner . . . Arc-welded steel-plate construction . . . Heavy-gauge woven steel mesh basket . . . Weight: 490 lbs. . . . Floor space: Just under 5 sq. ft. . . . Meets N.F.C. Specs. **Optional:** J.I.C. Control: Mounted on right, left side or wall. 160° supplementary heat: 2350-watt Chromalox, or steam.

Send for illustrated 4-page folder. Address Dept. P-116. New Holland Machine Company New Holland, Pa.

New Holland Machine Company

"RELIANCE" PRODUCTS

EFFICIENT • EFFECTIVE • DEPENDABLE

At no charge, our Engineering Department is always glad to make recommendations and help solve your polishing and/or plating problems

RELIANCE SELENIUM RECTIFIERS

BENCH OR FLOOR MODELS

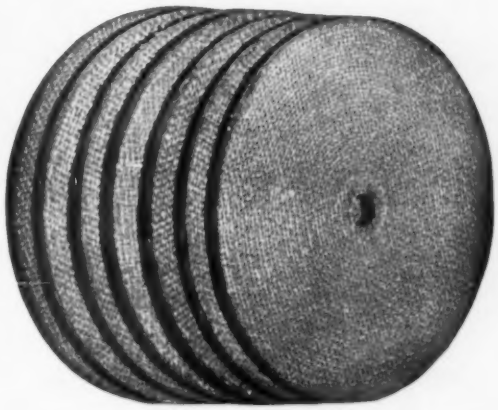
100 TO 5000 AMP OUTPUT

VOLTAGE RANGES
0- 6
0- 9
0-12
0-15
0-18
0-24

REMOTE CONTROL AT SMALL EXTRA COST

For that tough cutting down job on steel or stainless steel, solve your problem with

RELIANCE SISAL BUFFS



Specially treated:

For cooler operation—

For longer life by binding the fibres together to prevent fraying—

For better compound adherence—

To cut faster and bring up a high finish

RELIANCE matching compositions furnished in either molded cakes, or extruded to your specifications.

Chas. F. L'Hommedieu & Sons Co.

MANUFACTURERS of

Plating and Polishing Machinery

Complete Plating Plants Furnished

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and
Los Angeles

FOR FURTHER INFORMATION, USE READER SERVICE CARD; INDICATE A 1136.

EQUIPMENT & SUPPLIES

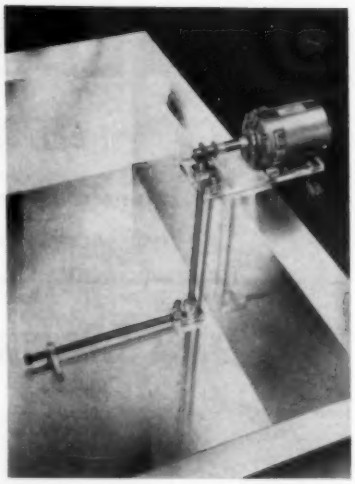
E—1130. Commercial Finish—The Conversion Chemical Corporation announces a new commercial metal finish for use on zinc die castings. The intense, dull black finish, known as Kenvert 11-B, provides excellent corrosion resistant properties when applied on the appropriate conversion coating for the particular metal to be finished.

Kenvert 11-B is designed to produce a uniform dense black finish on zinc, cadmium or zinc-base die castings. The process involved is fast, can be conducted at room temperature, requires no exhaust equipment, and features a cycling period which can be adjusted to automatic machine operation.

The base chromate coating of a metal to be finished can be made thicker, denser, and harder than those obtained by previous methods, and results in a durable, lasting finish.

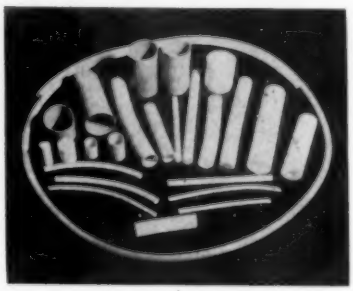
E—1131. Turbomatic Agitator—Dispensing with stirrers, rod agitators and external pumps, the Turbomatic Agitator specifically designed for the purpose by Technic, Inc., effectively agitates precious metal electroplating solutions. The new device is reported to afford vigorous but smooth agitation which has not heretofore been available.

Technic Turbomatic Agitator Model GTA-40 has a submerged positive displacement pump rated at 150 gallons per hour. As shown in the accompanying photo, Model GTA-40 is designed for use in a tank 24 inches long and up to 24 inches in depth. Submerged parts of the Technic Agitator are constructed of Teflon Bolderon Lucite and stainless steel. The complete unit is clamped to the side of the tank by an adjustable thumb screw, no other fastening being required.



Power for the Turbomatic Agitator is supplied by a ⅛ horsepower 110-volt 60-cycle single-phase ball bearing motor. Totally enclosed, the motor is on a vibrationless rubber mounting.

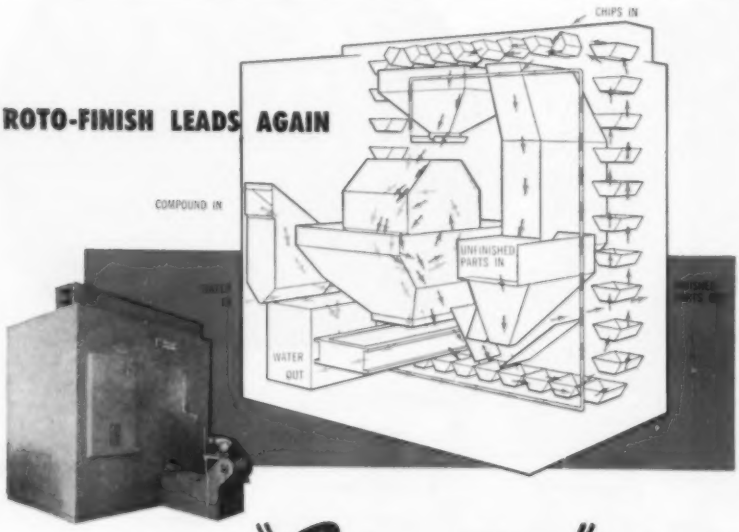
E—1132. Tubing and Lined Pipe—Haveg Industries, Inc. of Wilmington, Delaware, announces production of "Teflon" pipe and tubing and "Teflon" lined steel pipe. Pipe is being made in sizes up to 4 inch diameter; lined pipe in 2 inch sizes. It is also available in rods and special machine parts.



"Teflon", DuPont tradename for tetrafluoroethylene resin, has a combination of electrical, chemical, and thermal properties unmatched by any other single material. It is completely inert to practically all chemicals. It has no known solvent, and is attacked only by molten alkali metals and fluorine at elevated temperatures and pressures. "Teflon" is completely resistant to nitric, hydrochloric, sulfuric, hydrofluoric, and hydrobromic acids. Also unaffected by highly oxidizing compounds such as aqua regia and sulfur or chlorine dioxides.

E—1133. Unbreakable Drum—A new type, 13-gallon polyethylene drum, barrel-like in appearance and construction, is now in volume production at Plax Corp.,

ROTO-FINISH LEADS AGAIN



the new "Rotomation" MACHINE

MAKES MECHANICAL TUMBLING A FULLY AUTOMATIC BARREL FINISHING PROCESS

- Completely Automatic
- Needs no operator in attendance
- Loads and unloads itself with each cycle.
- Cycle variable for different part requirements.
- Provides continuous operation
- Assures uniformity of finish
- Low cost operation — high production
- Complete package unit
- Simple to install . . . Electric, water, air and drain connections only.
- Suitable for straight line production.
- Thus, "Rotomation" barrel finishing machine becomes a machine tool.

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News about
COATINGS for METALS
Metallic . . . . . Organic . . . . . Decorative . . . . . Protective

New process gives more corrosion-proof chromium plated finish

Savings in bright finishing start with the copper

Deposits from Unichrome Copper are so smooth, they reduce copper buffing time or help eliminate it entirely. Containing no cyanides, the pyrophosphate plating solution cuts costs of waste-disposal also.

While these two features prove most valuable to users of Unichrome Copper, there are many other operational advantages offered. Send for full data.

What's been happening in chromium plating?

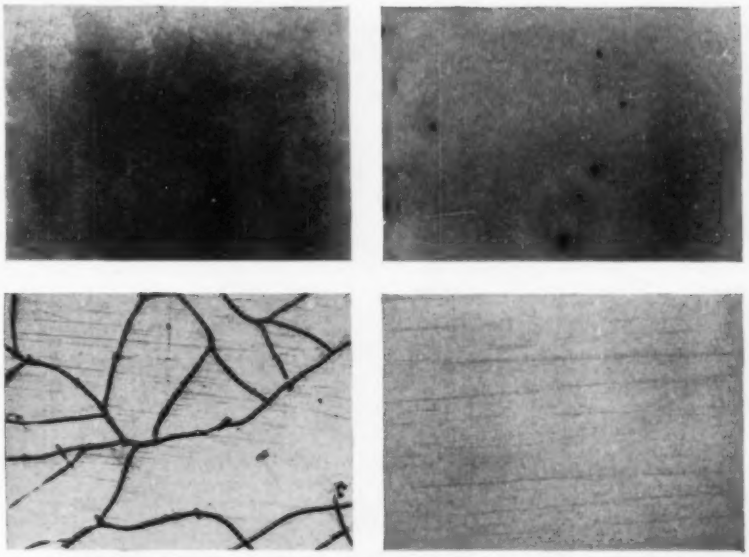
Major improvements in chromium plating in recent years have been due to characteristics of the Unichrome SRHS® Chromium Bath.

With its *speed*, SRHS Chromium helped cut plating time up to half. With its *self-regulation*, it simplified control for optimum plating balance. With its wider *bright plate range*, it cut down misplates. With its higher *cathode efficiency*, it saved power and stepped up production capacity of equipment.

These improvements are well documented by the records of hundreds upon hundreds of plants.

UNICHROME is a trademark of Metal & Thermit Corp.

METAL & THERMIT
CORPORATION
General Offices: Rahway, New Jersey
Pittsburgh • Atlanta • Detroit
East Chicago • Los Angeles
In Canada: Metal & Thermit—United Chromium of Canada, Limited, Toronto 1, Ont.



Top: (Left) After many months outdoors, a .0005" deposit of ordinary chromium, plated directly on steel, was rust-covered; (Right) Crack-Free Chromium, same thickness, was virtually unaffected. Bottom: (Left) Photomicrograph of etched ordinary chromium shows network of microscopic cracks. (Right) Etched Crack-Free Chromium deposit shows no such imperfection.

Experience with a relatively new kind of chromium finish reveals a most important difference in serviceability. This difference is graphically shown above. Unichrome Crack-Free Chromium Plating proves definitely, measurably superior to ordinary chromium for certain types of applications . . . notably those where durability and protection are paramount.

REASONS WHY

Crack-Free Chromium is *structurally* different from ordinary chromium plate. It does not develop the typical network of microscopic cracks—even in thicknesses specified for "hard" chromium plating. Corrosives find no path to the underlying base metal. Rusting is blocked.

Crack-Free Chromium can be plated directly on steel or zinc base die castings. It does not depend on an undercoat of scarce nickel for long life.

OTHER ADVANTAGES

In other ways, too, the new finish proves superior to ordinary chromium. It resists thermal shock and gives better protection at elevated temperatures. It gives improved non galling, non seizing properties.

A satin, matte finish, Crack-Free Chromium can be left as is, or readily buffed to high luster. Ask for recommendations, or send for Bulletin CFC-1.

EQUIPMENT & SUPPLIES

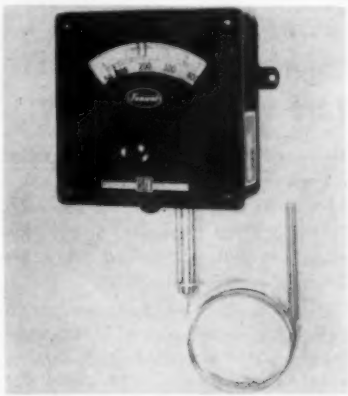
Hartford, Conn. The container is an addition to the company's line of 5, 6½ and 13-gallon carboys.

The heavy-duty container incorporates such features as two folding handles, pouring spout, separate opening for filling and venting, hand-grip on the bottom and strengthening ridges that permit the drum to be rolled on its side.

Complete provision has been made to permit stacking. Colored folding handles, and filling and pouring necks are located in a recessed area on the top of the drum. Top and bottom contours are convex to permit the containers to nest securely one on top of the other.

The container, made by Plax to a design originated in Italy by Montecatini and Pirelli, is lightweight, inert to corrosives and unbreakable. Arrangements are being made to secure I.C.C. approval.

E—1134. Indicating Temperature Controller—A new series of indicating temperature controllers built around interchangeable elements has been developed by Fenwal Incorporated, manufacturer of precision temperature controls and heat detectors. Fenwal's new Series 541 bulb-and-capillary controller offers high accuracy (within ± 2° F under optimum conditions), is rugged, easy to read, and is unusually convenient to adjust and service in the field.



An outstanding feature of the Series 541 controller is the wide choice of interchangeable elements, which permits the user to tailor the control to the application. Every major controller element—i.e., switching and indicating mechanism, switch type, temperature range, housing, bulb diameter, capillary length and materials of construction—is available in at least several variations or ratings.

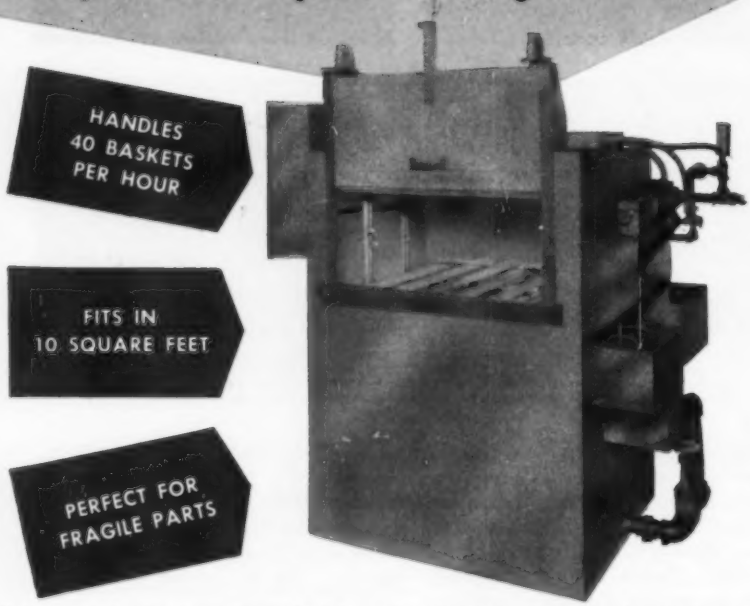
E—1135. Cementable Tapes—Cementable teflon tape, either single or double-faced, in practically any desired thickness from 0.0005 inches to 0.060 inches and in widths from ½ inch to 12 inches has been announced by the Enflo Corporation, Pennsauken, N.J.

Either or both surfaces of the tape are treated by a special Enflo process, which makes the Teflon readily "bondable" to glass, steel, aluminum, plastics or practically any other material including Teflon itself. General purpose epoxy resin adhesives including pressure-sensitive types serve as eminently satisfactory binding agents. Ultimate shear strength is on the order of 280 to 330 lb/sq in. Peel strength is approximately 40–45 lb/sq in. Samples are available.

E—1136. Ultrasonic Cleaner—A new ul'rasonic cleaning apparatus, Model AP-10-B, the latest in the Sonogen series of similar units, has been developed by Branson Ultrasonic Corporation of Stamford, Conn.

Designed for the SMALL PLANT . . .

New RANSOMATIC Saves Time, Money, Replaces Inadequate Cleaning Methods



Eliminate the bottlenecks and high costs that go with outdated metal cleaning methods. Replace still tanks, vapor cleaning or other inefficient operations with a new RANSOMATIC Cabinet Type Cleaning Machine.

Widely adjustable for any desired washing-rinsing-drying cycle, this machine is used by small plants or for departmental cleaning in large plants. It cleans up to 40 baskets of parts per hour . . . *Automatically!*

Fast, efficient, low-cost cleaning is as simple as this: Load baskets or larger individual parts into machine and shut door. That starts the machine. At the end of pre-set cycle, door opens and parts are ready for unloading!

PUT YOUR METAL CLEANING ON AN AUTOMATIC BASIS! FOR COMPLETE DETAILS, write to: Ransohoff, Inc., 640 North Fifth Street, Hamilton, Ohio

Ransohoff *An old name . . . the newest ideas*

14 SEPARATE REQUISITIONS for assorted chemicals come in to New York office of national manufacturer. Purchasing agent has *single* order made out and calls nearby Merchants office.

ENTIRE ORDER IS PUT ON TELETYPE to Merchants offices and warehouses across the country. Each of Merchants' other offices is similarly equipped to function as central ordering point.

DELIVERIES GO OUT IMMEDIATELY to all 14 plants. Each plant has its order filled from nearby Merchants warehouse; short haul delivery saves time and shipping costs.

SINGLE INVOICE FROM MERCHANTS covers all 14 shipments. By calling Merchants, this purchasing agent supplies the chemical needs of all his plants quickly and economically from a single, reliable source!

NATIONAL MANUFACTURER MAKES ONE CALL TO MERCHANTS, GETS LOCAL DELIVERY TO 14 PLANTS ACROSS THE COUNTRY!

Each Merchants office is geared to supply fast, efficient delivery of industrial chemicals from warehouses throughout the country. Each Merchants office provides all the advantages of nationwide service with all the economy of local delivery. A single call to Merchants saves you time, reduces your shipping costs, and simplifies to a considerable extent your order and invoice paperwork. Products include acids, alkalis, fungicides, surfactants, chlorinated solvents, emulsifiers, laundry compounds, soaps, dry ice and chemical specialties.

MERCHANTS CHEMICAL COMPANY, INC.

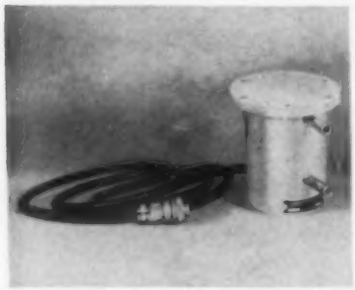
60 East 42nd Street, New York 17, N. Y.

SALES OFFICES AND WAREHOUSES: Chicago • Cincinnati • Denver • Louisville • Milwaukee • Minneapolis • New York • Omaha

STOCK POINTS: Albuquerque, N. M. • Erwin, Tenn. • S. Norwalk, Conn. • Columbus, Ohio

EQUIPMENT & SUPPLIES

The AP-10-B is a small, compact instrument, designed specifically for bench-top operation in the washing of delicate, intricate parts that must be "surgically" clean,



such as watch mechanisms, instrument components, small and miniature ball-bearings, electronic parts.

The new instrument comprises a 36–40 kc/sec power generator, and a cylindrical cleaning tank, with transducers hermetically sealed into the base. RF power output of the generator is 50 watts average, 200 watts peak on pulses. Tanks are of 1-pint, 1-quart, or ½-gallon capacity, giving a maximum effective cleaning area of 18 square inches. Two of the smaller tanks may be operated simultaneously, and two of the larger tanks alternately, depending on tank size specified.

Cleaning is effected by ultrasonic activation of the solvent, which literally blasts soils away from the surfaces to be cleaned. However, the ultrasonic "scrubbing" is, paradoxically, so gentle that it cannot harm even the most delicate components. Also, the cleaning action reaches all surfaces accessible to the fluid, even blind holes, complex geometry, and those areas almost impossible to clean by conventional methods.

E—1137. Pt Crucible—An improved type of Platinum crucible has been developed by Baker & Company, Newark, N.J., manufacturers of a complete line of platinum laboratory ware.

The new crucible is polygon-shaped, and incorporates a number of unusually useful features. It has been tested exhaustively under actual laboratory conditions, and has demonstrated considerably greater stability, versatility, and ease of handling than the conventional round shape.

The flat sides of the polygon extend only three-quarters of the way down, and the lower part of the crucible is tapered and circular in shape, with a flat bottom.

Among the important advantages of the new polygon-shaped crucible are these:

1. The crucible can be picked up with tongs more easily, without the danger of crimping, so prevalent when the round crucible is handled with tongs.

2. When picked up for pouring, the polygon shape always provides a corner spout opposite each flat side, making the process considerably easier.

3. Two hot crucibles, flat side to flat side, can be picked up at one time with greater ease and safety.

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A VOLUMETRIC DETERMINATION OF TRACES OF ZINC IN NICKEL PLATING SOLUTIONS

by Thomas A. Downey*

This paper describes a volumetric determination of trace amounts of zinc in nickel plating solutions. Basically, the analysis consists of two parts. The first part is the extraction and separation of the zinc as a zinc thiocyanate complex into an amyl alcohol ether mixture. This separates the zinc from the nickel solution and any impurities present. The second part is the complexometric titration of the extracted zinc with ethylenediaminetetracetic, disodium salt. The procedure is relatively simple and rapid and does not require the use of any expensive instrumentation. The only impurity in nickel solutions which was found to interfere with this determination was cadmium.

INTRODUCTION

DUE TO THE INCREASE in the amount of zinc die castings being nickel plated and because of the high standards required of bright nickel plating, the possible influence of zinc impurities in nickel baths is of great importance to our industry. The analytical determination of zinc in nickel solution is described in a paper by E. J. Serfass[1] et al (*American Electroplaters' Society Project No. 2*). This method is an excellent one, however, it is quite lengthy, requires the use of unstable reagents which must be frequently prepared and necessitates the preparation of a calibration curve and the use of a colorimeter.

Kinnunen and Wennerstand[2] described a volumetric method for the determination of zinc in nickel sulfate salts, however, they did not explore the application of this method to the determination of zinc impurities in nickel plating solutions, or the influence of all the possible solution impurities in the determination. This paper describes the application of this method and the effects of the common impurities in nickel solutions.

METHOD

A. Reagents and Special equipment†

1. 0.5M Sulfuric acid.

Dissolve 14 ml of concentrated sulfuric acid (1.83 sp/gr) in sufficient distilled water to make 500 ml.

2. Saturated solution of Thiourea ($NH_2C(=S)NH_2$).

Saturate 100 ml of distilled water with thiourea by shaking vigorously in a stoppered flask.

3. Fifty per cent (w/v) of Ammonium Thiocyanate (NH_4CNS).

Dissolve 250 grams of ammonium thiocyanate in sufficient distilled water to make 500 ml.

4. 1:5 N-Amyl alcohol—Ether mixture.

Mix 100 ml of n-amyl alcohol with 500 ml of diethyl ether.

5. 2.5 per cent Ammonium Thiocyanate Solution.

Dilute 25 ml of the 50 per cent ammonium thiocyanate solution to 500 ml.

6. Solid ammonium bifluoride (NH_4HF_2).

7. Ammonia—Ammonium Chloride Buffer.

Dissolve 54 grams of NH_4Cl in 500 ml of distilled water, add 350 ml of concentrated ammonium hydroxide (sp gr 0.90) then dilute to a liter.

8. Twenty per cent Sodium Cyanide Solution (NaCN).

Dissolve 20 grams of NaCN in sufficient distilled water to make 100 ml.

9. Erichrome Black T Solution—0.5 per cent.

Use solution as supplied from E. H. Sargent Company or Harleco (Catalog No. 1107x).

10. Four per cent Formaldehyde Solution.

Dilute 25 ml of 36 per cent formaldehyde solution to 225 ml.

11. Standard Zinc Solution—10.00 mg/ml.

Dissolve exactly 2.500 grams of metallic zinc in a minimum amount of concentrated hydrochloric acid, then dilute to exactly 250 ml in a glass stoppered volumetric flask.

12. 0.05 M Ethylenediaminetetraacetic Acid, Disodium Salt (EDTA).

Dissolve 19.0 grams of EDTA in sufficient distilled water to make one liter.‡

This solution is standardized as follows:

Pipette 10.00 ml of the standard zinc solution in a 500 ml wide mouth Erlenmeyer, add 15 ml of the ammonia-ammonium chloride buffer, dilute to 250 ml, then add about 0.3–0.5 ml of the Erichrome Black T indicator solution. Titrate with the 0.05 M EDTA. When the indicator is initially added to the solution, the solution turns a pinkish blue, as the solution is titrated, the solution will gradually turn a slate gray blue, then at the endpoint the solution will turn a greenish blue color. This endpoint color is reproducible within a few drops of the 0.05M EDTA, once the operator is familiar with the standardization.

The molarity of the 0.05M EDTA is calculated as follows:

$$\frac{100.0 \text{ mg}}{65.38 \text{ mg} \times \text{ml of EDTA required}} = \text{Molarity of the EDTA solution}$$

This standardization should be run in duplicate or triplicate to insure accurate results.

13. 0.002M EDTA Solution.

This reagent should be stored in a clean polyethylene bottle. It is stable for at least 2 weeks or longer.

Pipette 20.0 ml of the 0.05M EDTA into a 500 ml volumetric flask, dilute to the mark, stopper and shake thoroughly. The molarity of this solution is obtained by dividing the molarity of the 0.05M EDTA solution by 25.

14. Six Squibb Separatory Funnels—125 ml capacity.

† All the chemicals used must be of American Chemical Society grade and the water must be zinc free distilled or deionized. The reagents should be stored in pyrex or polyethylene bottles.

‡ Eastman Kodak EDTA catalog No. 6354 was found satisfactory.

* Analytical Chemist, J. C. Miller Division, Hanson-Van Winkle-Munning Company.

15. 25 and 50 ml Schellback burettes.

B. Procedure

1. Pipette a 25 ml sample of the nickel solution into a 125 ml separatory funnel and add 15 ml of distilled water.

2. Add 0.5 ml of the 0.5M sulfuric acid, then 3–4 drops of the saturated thiourea solution. Stopper the separatory and shake for 1–2 minutes.

3. Using a 25 ml graduate, add 15 ml of the 50 per cent ammonium thiocyanate solution, then shake the solution for one minute.

4. Add 15 ml of the amyl alcohol ether mixture and shake the solution thoroughly for 1–2 minutes. Allow the two layers to separate. If the organic layer (top) is a dark red, iron is present as an impurity, a deep blue indicates cobalt.

5. Withdraw the bottom aqueous phase into a second separatory funnel. Rinse the stem of the first funnel with a few drops of distilled water. The rinsings should be added to the aqueous solution in the second funnel.

6. Add 15 ml of the amyl alcohol ether mixture to the second separatory funnel and shake the mixture thoroughly for 1–2 minutes.

7. After allowing the two phases to separate, withdraw the bottom aqueous phase into a third separatory funnel and repeat the extraction. Allow the two phases to separate, then discard the bottom aqueous phase. Three extractions are usually more than sufficient to extract the zinc from the nickel solution, however, if the nickel solution is heavily contaminated with iron or cobalt, four extractions may be necessary.

8. Combine all of the amyl alcohol ether extracts, rinsing the separatory funnels with small portions of the amyl alcohol ether mixture. Add the rinsings to the combined amyl alcohol ether extracts.

9. Add 15 ml of the 2.5 per cent ammonium thiocyanate solution to the combined amyl alcohol ether extracts and shake gently for 2 minutes. The mixture should be shaken gently in order to avoid possible formation of an emulsion which would take considerable time to clarify.

10. After the phases have separated, withdraw and discard the lower aqueous phase.

11. Repeat steps 9 and 10, only add a pinch of ammonium bifluoride before shaking the solutions. The organic layer, which is usually red, due to the presence of iron, will become colorless upon gentle shaking with the ammonium bifluoride.

12. Discard the aqueous layer and repeat the washing with the 2.5 per cent ammonium thiocyanate. During this third washing, the organic amyl alcohol ether layer may turn a slight reddish color due to possible traces of iron in the 2.5 per cent ammonium thiocyanate solution. This color can be removed by adding a few crystals of ammonium bifluoride.

13. After allowing the two phases to separate and clarify, discard the lower aqueous layer and rinse the stem of the separatory funnel with a few drops of distilled water.

14. Transfer the amyl alcohol ether solution into a 500 ml wide mouth Erlenmeyer flask, by allowing the solution to drain into the flask. Rinse the separatory funnel thoroughly with distilled water, collecting the rinsings in the 500 ml Erlenmeyer flask, then dilute the solution to 250–300 ml with distilled water.

15. Add 15 ml of the ammonia-ammonium chloride buffer and mix thoroughly by swirling, then add 1 ml of the 20 per cent (w/v) potassium cyanide solution, and about 0.3–0.5 ml of the Erichrome Black T indicator solution. The amount of indicator used somewhat depends on the age of the preparation in use and the analyst. Sufficient indicator should be used so that the solution is distinctly colored, however, and excess of indicator should be avoided as it makes the detection of the endpoint more difficult. Use the same amount of indicator for the blank and sample determinations. The solution should be thoroughly mixed before each addition. The solution will turn a blue gray color after the addition of the indicator. If the solution color is not blue gray, but a pinkish blue, add more potassium cyanide in 0.25 ml increments until the solution does turn blue gray.

16. Add 5 ml of the 4 per cent formaldehyde solution and swirl the solution thoroughly. The solution should turn a pinkish blue color. If the solution does not turn pinkish blue, add more of the 4 per cent formaldehyde in 1 ml increments until the solution does turn pinkish blue.

17. Using a clean 25 ml burette, titrate the solution with the standardized 0.002M EDTA solution. The solution must be swirled thoroughly during the titration in order to insure proper mixing. The solution should undergo the following color changes as it is titrated; at the start of the titration the solution is a pinkish blue, as the titration proceeds, the solution gradually turns a slate gray color. When the endpoint is approaching, this slate gray color turns blue, then at the endpoint, the color changes to a greenish blue. This color is easily reproduced after a few trial titrations.

18. Run a blank using 25 ml of distilled water in place of the nickel sample and proceed as directed for the sample.

C. Calculations

Let A = ml of 0.002M EDTA required for sample titration

Let B = ml of 0.002M EDTA required for blank titration

$$\frac{(A\text{-}B) \times \text{Molarity of 0.002M EDTA} \times 65.4 \times 1000}{25} =$$

parts/million of zinc in the sample.

EXPERIMENTAL

A. In order to test the applicability of this procedure to nickel solutions, a standard Watts solution of the following composition was prepared from A.C.S. reagent grade chemicals:

Nickel	11.0 oz/gal
Nickel Chloride	8.0 oz/gal
Boric Acid	5.0 oz/gal

Using the procedure outlined, this solution was analyzed for zinc, and found to contain 10 parts per million (mg/L). To 25 ml of this stock Watts solution, zinc was added to give a solution which contained 25, 50, 100 and 200 parts per million of zinc. These solutions were then analyzed in duplicate using the procedure outlined above. Table I

lists the comparisons of these results versus the added amounts plus the initial zinc in the Watts solutions. The average recovery is adequate for this type of determination.

B. Impurities

Since most commercial nickel baths contain varying amounts of impurities, this analysis would be of little value as a determination for zinc unless it were specific in the presence of these impurities. In order to test the influence of these impurities on this assay, a liter of the standard Watts solution was contaminated with the chemicals listed in Table II. These concentrations of impurities are in most cases considerably above the amounts present in commercial nickel plating baths. To this impure Watts solution 72 mgs/liter of zinc were added. The recovery of this zinc is described in Table III. If Table I and Table II are compared, it is noticed that there is an increase of zinc found in the pure against the impure Watts solutions. This difference was found to be due to the zinc in the chemicals used to contaminate the pure Watts solution. A separate determination run on the salts used to contaminate the Watts solution showed that they introduced an additional 5.18/ml of zinc.

Wennerstand and Kinnunen[2] stated that cadmium will interfere with the analysis of zinc by the above procedure. In order to check the possible interference of cadmium on this determination, one milligram of cadmium was added to duplicate 25 ml sample of the pure Watts bath and the samples were analyzed. This cadmium concentration is equivalent to 40 mg/L of cadmium in the pure Watts solution or calculating the cadmium as zinc, 23 mg/ml.

The analysis showed 25.0 mg/L of zinc to be present. Therefore, cadmium does interfere with this determination and is quantitatively removed and determined as zinc. However, because of the relative differences in the atomic weights of zinc and cadmium and the fact that cadmium is not a common impurity (unless it is used as a brightener) in plating solution, the influence of cadmium on this determination usually need not be considered.

Due to the variety of bright organic nickel solutions which contain various addition agents, no attempt was made to determine the influence of these compounds on the assay. However, it is the author's opinion that most of the organic addition reagents will not interfere with the determination. However, if they do interfere, they can be destroyed by wet oxidation with nitric and sulfuric acids. The sample should then be evaporated to near dryness, cooled, dissolved in water, neutralized to a *p*H of 2.5 to 3.0 and analyzed as outlined.

SUMMARY

The determination of zinc in nickel solutions, which is described, is a relatively simple extraction, volumetric procedure. The method will easily lend itself to routine use in those plating plants which do not possess the instruments necessary for colorimetric procedures. The method is specific for zinc in presence of the common impurities present in nickel plating solutions.

REFERENCES

[1]Serfass, E. J., Levine, W. S., Prang, P. J., Perry, M. H., Plating **36,** 818 (1949).

[2]Kinnunen, J. and Wennerstrand, B., Chemist Analyst **42,** 80 (Dec. 1953).

TABLE I
RECOVERY OF ZINC ADDED TO WATTS SOLUTION

Zinc Added*	Zinc Found	Theory	Per cent difference
0	10		
25	32	35	−8.5
50	61	60	+1.8
100	106	110	−3.5
200	207	210	−1.2
			Average 2.8%

* All the results are in mg/L of zinc added to the Watts solution.

TABLE II
CONCENTRATION OF SALTS USED TO CONTAMINATE THE WATTS SOLUTION

Impurity	Salt Used	Concentration of Impurity*
Aluminum	$Al\ NH_4(SO_4)_2 \cdot 12H_2O$	200
Trivalent Chromium	$Cr_2(SO_4)_3 \cdot nH_2O$	150
Hexavalent Chromium	CrO_3	10
Cobalt	$CoSO_4 \cdot 7H_2O$	100
Copper	$CuSO_4 \cdot 5H_2O$	25
Iron	$FeSO_4 \cdot 7H_2O$	150
Lead	$Pb(NO_3)_2$	20
Magnesium	$Mg(NO_3)_2 \cdot 6H_2O$	500
Manganese	$Mn\ SO_4 \cdot 4H_2O$	150
Calcium	$CaSO_4 \cdot 2H_2O$	saturated

* Concentration of the impurity (not the salt) in mg/L in the Watts solution.

TABLE III
RECOVERY OF ZINC ADDED TO CONTAMINATED WATTS SOLUTION

Zinc Added	Zinc Found	Theory
0	16	
72	91	88
72	91	88

T. A. Downey was born in Brooklyn in 1926. Received a B.A. in Chemistry from N.Y.U., thereafter worked for Charles Pfizer and Co., Brooklyn. M.S. in Analytical Chemistry from Polytechnic Institute of Brooklyn in 1953. Has extensive experience in analytical instrumentation. Joined Hanson-Van Winkle-Munning Co. in April 1953, as head of the analytical laboratories. Aim there was to develop new instrumental analytical methods and revise and improve standard procedures. Succeeded in applying polarographic and spectrophotometric procedures to numerous plating salts and solutions. Now hopes to analyze all the metallic components of baths by rapid specific instrumental methods. Is married and has one son. Is a ACS and AES member.

ADDITION AGENTS IN NICKEL PLATING

by Robert B. Fischer and Charles E. Ring*

AN ADDITION AGENT in an electroplating process is a substance added to the plating bath to modify the physical properties. As yet, there is not a complete understanding of the relation of addition agents to the physical properties, but this fact is not surprising in view of the large number of variables in the plating process.

It was desired in this research to investigate certain phases of the brightening mechanism of addition agents by isolating, insofar as possible, the effects of the addition agent from the effects of all other conditions and components of the plating bath. Therefore, the basis metal (copper), the surface preparation of the basis metal, temperature, *p*H, current density, agitation and the physical dimensions of the plating apparatus were all kept constant. The addition agent, its concentration and the thickness of the nickel deposit were varied systematically. Two addition agents were selected, 1,5-naphthalene disulfonic acid and saccharin, both of which have been found to enhance the brightness of nickel deposits[1, 2]. Experimental methods of observing the deposits included specular reflectivity measurement, diffuse reflectivity measurement, x-ray diffraction, electron diffraction and electron microscopy.

* Department of Chemistry, Indiana University, Bloomington, Indiana.

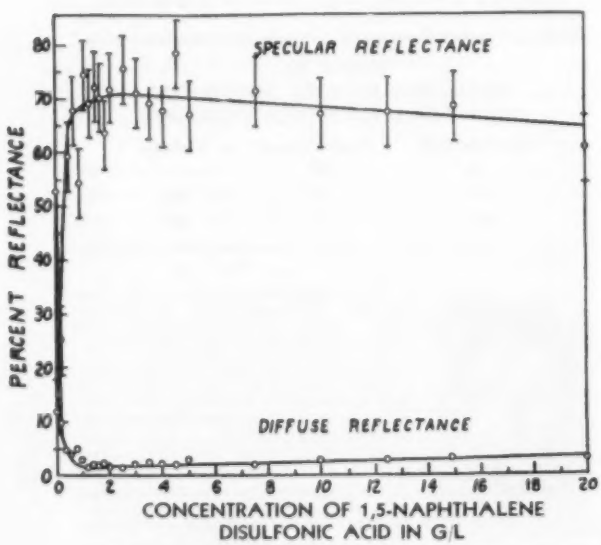


Figure 1. Reflectances at 525 mμ of the thick (25 μ) series of deposits obtained in the presence of a 1,5-naphthalene disulfonic acid

HISTORICAL INTRODUCTION

In physical optics, the intensity of reflected light is the basis of the term, "brightness." The plater uses the term, either consciously or unconsciously, to signify the ratio of specularly reflected light intensity to the intensity of diffusely reflected light[3, 4]. The lower the latter is, the brighter the specimen appears. Springer, for example, rates a deposit of 0 to 2 per cent diffusely reflected light as of high brightness, 2 to 8 per cent as semi-bright, 8 to 13.5 per cent as matt with a faint gloss, and 13.5 to 50 per cent as matt[5].

Several theories have been proposed to relate brightness to the physical structure of a deposit. First, it has been suggested that brightness is related to the degree and type of preferred orientation of the deposit, but the bulk of the evidence reported in the literature is not in agreement with this suggestion. Second, it has been proposed that brightness is a function of particle size, with a deposit being bright if its crystal size is less than the wave length of the light used for observation. Although some evidence has been reported by several workers in support of this concept, it cannot provide the whole explanation. For example, Leidheiser and Gwathmey deposited nickel, in the absence of addition agents, on single crystal spheres of copper and of nickel; the deposit on a (100) face was bright and was a single crystal, while the deposit on (111) faces was matt and polycrystalline.[6]

Third, it has been proposed that brightness is dependent upon the microsmoothness of the surface of the deposit. A smooth surface presumably exhibits relatively little diffuse reflectance so would be bright. Surfaces which are extremely smooth may be prepared by at least two methods entirely apart from the use of addition agents: if the basis metal is smooth, a deposit may be equally smooth

as long as that deposit is not too thick;[6] periodic current reversal may produce a surface leveling effect, even increasingly so as the deposit thickens.[7, 8] Some evidence has been presented that the brightening action of addition agents may also be due to a microleveling process.[9, 10, 11, 12]

The quantitative measurement of brightness has long been fraught with difficulty. Many workers have evaluated brightness simply by visual observation; this method is useful for some comparisons but is hardly quantitative. Several instrumental methods have been devised and have given useful measurements in some cases, but they have often provided poor agreement between the order in visual comparison and in instrumental comparison within a series of specimens. So direct measurements of diffuse reflectance have been made, but the selection of a single, representative reflectance angle has been difficult.[5]

Some reports have been published in which electron microscopy has been used in the study of electroplating processes; most of these have been exploratory with little or no attempt to relate the various plating conditions to the structure of the resultant deposit. However, Weil and Read did make a study of the effect of organic brighteners on the brightness of nickel deposits, concluding that there is, at most, only a very general relationship between surface structure and brightness.[2] The same authors also used the electron microscope in evaluating the effects of several variables, apart from addition agents, on the surface structure of the deposit.[13]

EXPERIMENTAL METHODS

Plating cell. Electrodepositions were performed in a one and one-half liter pyrex beaker. A 250 watt infrared heat lamp provided adequate temperature control, as suggested by Read,[14] at 55 ± 1° C. Mechanical stirring was employed. The anode consisted of low carbon nickel in a vinyon bag. A special cathode box was constructed of lucite to hold the copper strip upon which deposition was to occur; deposition was limited to an area of 1 inch by 2½ inches. Each copper strip was electropolished in a phosphoric acid-n-butanol mixture prior to use.

Plating bath. A low *p*H Watts type bath was prepared with the following composition per liter: 330 grams $NiSO_4 \cdot 6H_2O$, 45 grams $NiCl_2 \cdot 6H_2O$ and 30 grams H_3BO_3. This solution was purified and analyzed by conventional procedures,[15] following which the *p*H was adjusted to 2.5 with conc. H_2SO_4. The *p*H adjustment was repeated as needed after each plating experiment. Appropriate amounts of addition agent were added to portions of this stock solution for the preparation of each test specimen. The current density was 50 amperes per square foot. Both thick (about 25 micron, or 0.001 inch) and thin (about 500 A°, or 2×10^{-4} inch) series of deposits were prepared from baths containing from 0 to 20 grams 1,5-naphthalene disulfonic acid per liter, and two series of thick (about 25 micron, or 0.001 inch) deposits were prepared from baths containing from 0 to 10 grams saccharin per liter. At least 18 samples were prepared in each series.

Diffuse reflectance measurement. The diffuse reflectance of each specimen was measured with a spectro-

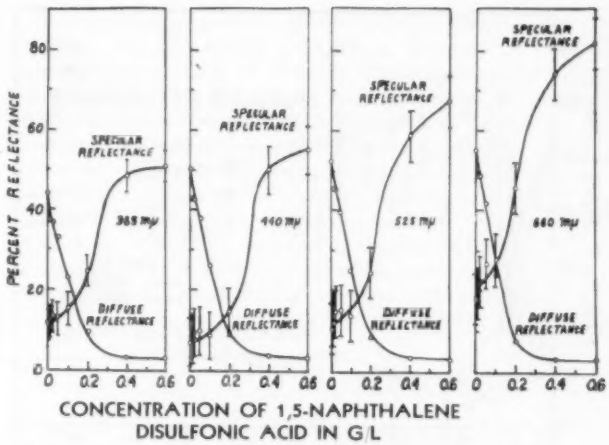
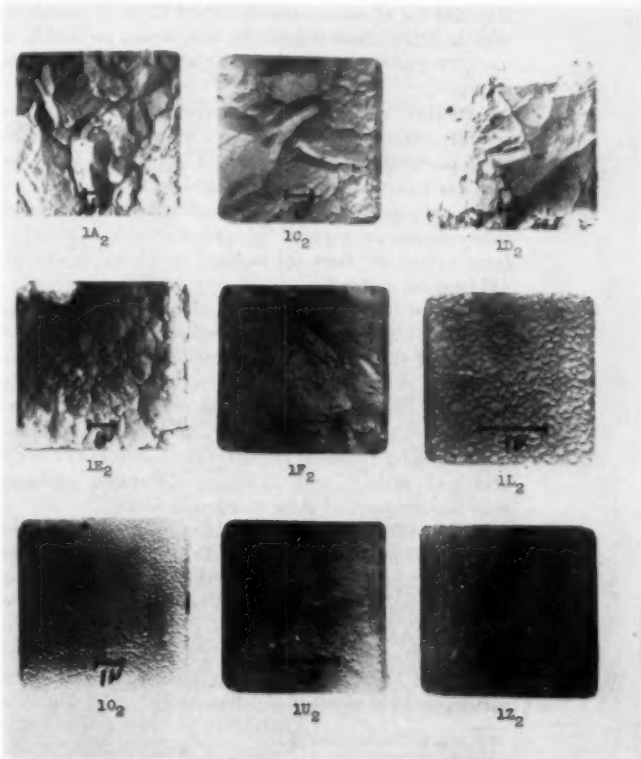


Figure 2. Reflectances at several wavelengths of the thick (25 μ) series of deposits obtained in the presence of 1,5-naphthalene disulfonic acid

Figure 3. Replica electron micrographs of representative samples in the series of thick (25 μ) deposits obtained in the presence of 1,5-naphthalene disulfonic acid. (Concentrations in g per l of the addition agent are as follows: $1A_2$, 0.00; $1C_2$, 0.02; $1D_2$, 0.05; $1E_2$, 0.10; $1F_2$, 0.20; $1L_2$, 1.40; $1O_2$, 2.00; $1U_2$, 5.00; $1Z_2$, 20.00)



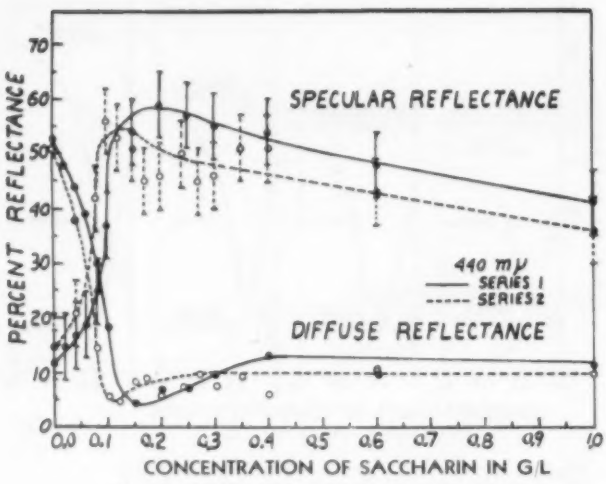


Figure 4. Reflectances at 440 mμ of the two thick (25 μ) series of deposits obtained in the presence of saccharin

photometer† equipped with a reflectance attachment. Light strikes the sample at 90° to the surface, and light reflected at angles from 35–55° is collected by a ring mirror and measured. Surface roughness, not specular reflectivity, is thus measured. So a very smooth surface yields a low reading, and a rough surface a high reading. The method is actually a comparison method, so a pressed block of magnesium carbonate was used as a reference standard for all measurements except those of specimens with so little diffuse reflectivity that it was preferable to use a piece of chromium squeegee plate as an intermediate standard.

Specular reflectance measurement. Direct, or specular, reflectance was measured on a nefluorophotometer‡ modified for the purpose. Light struck both the test specimen and an arbitrary standard (a piece of chromium squeegee plate) at 45° angles, and comparative measurement was made of the intensities of light reflected from each at 90° from the incident light (that is, also at 45° from the surface).

Electron microscope and electron diffraction. Chromium shadowed, parlodion replicas were made of the surfaces of the deposits by conventional methods for examination in the electron microscope.[16] The thin deposits were also observed directly by an electron microradiographic technique after freeing the nickel layer from the basis metal by dissolving the latter in a mixture of chromic acid and sulfuric acid. Electron diffraction patterns were also prepared of these stripped deposits.

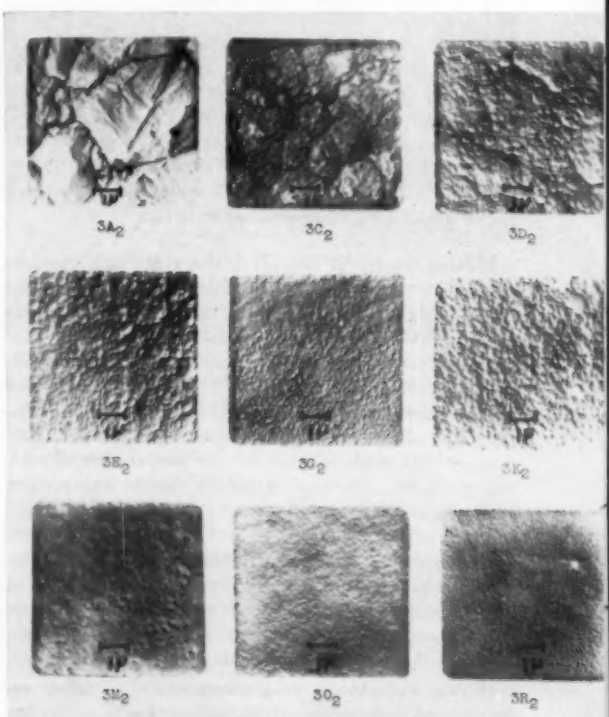
X-ray diffraction. X-ray diffraction patterns were obtained of the thick deposits. To insure that only the deposited nickel contributed to the patterns, the basis metal was removed by dissolution in chromic acid-sulfuric acid. Each nickel specimen was mounted in a Norelco powder diffraction camera in such a way that both "forward" and "back reflection" portions of the diffraction pattern could be obtained simultaneously. A few patterns were also obtained on flat film, instead of in a cylindrical camera, to provide a more thorough check on preferred orientation.

† Beckman DU Spectrophotometer.
‡ Fisher Nefluorophotometer.

EXPERIMENTAL OBSERVATIONS

Thin deposits with 1,5-naphthalene disulfonic acid. Specular reflectance measurements revealed variations with standard deviations of 4 to 6 per cent out of total reflectances of from 66 to 94 per cent at various wave lengths. These variations were random throughout the series and did not correlate with the amount of addition agent present. It is concluded, therefore, that this extent of variation arises from random variations in the basis metal surface and in this instrumental method of measurement, particularly the latter. Diffuse reflectances were of the order of 1.7 per cent with no addition agent present, and decreased to about 1.2 per cent with 0.05 gram of addition agent present; there were little or no further changes throughout the series. Electron micrographs of these stripped, thin deposits revealed some variation, but it was evident that these specimens for microscopic observation were essentially just replicas of the original basis metal surface. Both electron and x-ray diffraction patterns revealed preferred orientation, but it was not modified in any way by the presence or absence of addition agent in the plating bath. Therefore, it is concluded that

Figure 5. Replica electron micrographs of representative samples in a series of thick (25 μ) deposits obtained in the presence of saccharin. (Concentrations in g per l of the addition agent are as follows: $3A_2$, 0.00; $3C_2$, 0.08; $3D_2$, 0.10; $3E_2$, 0.12; $3G_2$, 0.17; $3K_2$, 0.30; $3M_2$, 0.40; $3C_2$, 1.00; $3R_2$, 10.00)



the 1,5-naphthalene disulfonic acid, in concentrations of 0 to 20 grams per liter, exerts no effect upon the brightness or upon the discernible structure of nickel deposits if those deposits are no more than 500 A° (2×10^{-6} inch) thick.

Thick deposits with 1,5-naphthalene disulfonic acid. Figure 1 shows both specular reflectance and diffuse reflectance data at one selected wavelength for this series of deposits. Further detail in the 0 to 0.6 gram per liter concentration range is shown for several wavelengths in Figure 2. The range markers on the specular reflectance values are based upon the standard deviations obtained with the thin deposits and are intended to indicate approximate extents of variation which could be attributed to random variations in the basis metal and in the measurement process. As the concentration of the addition agent increases up to about 0.5 gram per liter, the diffuse reflectance decreases markedly and the specular reflectance increases. Both remain fairly constant with further increases in concentration of addition agent.

Replica electron micrographs of representative samples throughout the series are shown in Figure 3. With no addition agent, large, well-developed crystal faces appear. As the 1,5-naphthalene disulfonic acid concentration is increased, substructure becomes visible on the surfaces of the large crystal faces. When the concentration reaches 0.2 gram per liter, the individual crystal faces no longer appear, and a new type of structure dominates.

X-ray diffraction patterns reveal no change in preferred orientation throughout the series. However, the crystal size does decrease somewhat, as revealed by a progressive increase in line breadths from 0.0 to 0.2 gram of 1,5-naphthalene disulfonic acid per liter.

Thick deposits with saccharin. Two complete series were run. The results of both diffuse and specular reflectivity measurements at one typical wavelength are shown in Figure 4. The diffuse reflectivity rapidly reaches a minimum, then rises a little and levels off. The specular reflectivity quickly rises, then decreases slightly and levels off.

Electron micrographs of shadowed replicas of representative samples throughout the series are shown in Figure 5. As the concentration of saccharin is increased from 0.0 to 0.1 or 0.2 gram per liter, the surface grain size decreases with a corresponding decrease in surface roughness, with relatively minor changes thereafter. X-ray diffraction patterns also revealed a decreasing crystal size early in the series with relatively little further change.

SUMMARY AND CONCLUSIONS

Some of the experimental methods developed and used in this study, particularly the combined methods of measuring specular and diffuse reflectance, should find wider applicability in the study and evaluation of electroplating processes.

The observations of the thin (500 A°, or 2×10^{-6} inch) deposits indicated that 1,5-naphthalene disulfonic acid had no effect on the physical characteristics of the deposits which were studied. This conclusion indicates that the properties of a thin nickel deposit are governed primarily by the nature of the surface of the basis metal.

Both addition agents did, however, exert considerable influence upon the physical properties of the thick (25 micron) deposits. Up to an optimum concentration, each addition agent increased the specular reflectance, decreased the diffuse reflectance, made the surface of the deposit smoother, and decreased the surface grain size and crystal size. The optimum concentrations were about 0.3 to 0.5 gram per liter for 1,5-naphthalene disulfonic acid and about 0.1 to 0.2 gram per liter for saccharin. Thus, the increase in brightness as caused by the addition agent, is accompanied by, if indeed not caused by, increasing surface smoothness and decreasing crystal or surface grain size.

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Robert B. Fischer received a BS from Wheaton College and a PhD in analytical chemistry from the University of Illinois in 1946. He served as a research chemist on the Manhattan Project and as an instructor in chemistry at the University of Illinois prior to joining the faculty at Indiana University in 1948. He is presently an Associate Professor. He has done research in various areas of analytical chemistry, including applied instrumental analysis. He is the author of numerous research articles and two textbooks.

Charles E. Ring received a BS from Michigan State University and a PhD in analytical chemistry from Indiana University in 1956. He participated in this plating research and in other research in applied instrumental analysis at Indiana University. He has recently joined the research staff of the Minnesota Mining and Manufacturing Company.

New Acrylic Fibers Prove Economical As Work Clothing Fabric

by J. S. MCGILLY*

This article is presented for its general interest, not as a technical paper. Advantages that may be expected from work clothes made of fabrics resistant to chemicals are cited.

THE DEVELOPMENT OF chemically-resistant fabrics for industrial work clothes that will stand up under extremely rugged wear and repeated launderings, has been a major contribution of the new man-made acrylic fibers, such as Acrilan, Dynel, and Orlon.

Damage to regular cotton clothing from daily exposure to acids, alkalies, salts and other chemicals used in plating

A Worker at the Army Ordnance Corps' Picatinny Arsenal wears a 100 per cent acrylic fiber uniform while applying a protective zinc finish to ammunition parts. Accidental splashing of the harsh cyanide and caustic solution on previously used wool or cotton uniforms, completely degraded the garment after one to two weeks' wear. The new uniforms have now been in use for over a year and no replacements due to acid damage have been required

* Assistant Sales Manager, Textile Fibers Department, Carbide and Carbon Chemicals Company, A Division of Union Carbide and Carbon Corporation.

operations represents a constant problem in replacement costs, especially in shops that provide work uniforms or give employees a clothing allowance.

In some cases, the combination of accidental acid splashes and corrosive vapor in the plant atmosphere limits useful life of shirts and trousers of ordinary fabrics to as little as a week.

Under the same conditions and wear, however, acrylic fiber work clothes have been found to last an average of ten times as long as cotton garments. Dynel work clothes, for example, are entirely unaffected by many harmful chemicals which, when spilled on cotton or wool uniforms would disintegrate them almost immediately. Dynel fabrics have been proven to withstand such chemicals as sulphuric, hydrochloric and chromic acid, sodium hydroxide, as well as other alkalies and salts.

Equally important as an economy factor is the ability of these synthetics to undergo frequent laundering. This is especially true of clothing subject to excessive job filth which is turned in weekly for cleaning by industrial launderies using strong detergents.

LOW MOISTURE ABSORPTION

The chief reason that Dynel resists chemicals and corrosive vapors is its inert character. Made of a resinous polymer, derived from the chemicals vinyl chloride and acrilonitrile, its moisture absorption is low and water-borne chemicals have difficulty penetrating the fibers to cause degradation.

While the major users of acrylic fiber clothing include chemical plants, storage battery producers and electroplating shops, the acid-resistant garments are also being adopted as standard in a number of other industries. These take in certain operations in food processing plants and steel mills. Laundries supply service stations with rental Dynel coveralls to stop holes caused by battery acid. Coal miners working near acid mine water find Dynel shirts and pants not only resist acids but are more comfortable in the damp atmosphere.

Acrylic fiber fabrics are also being widely accepted for laboratory coats and aprons for use in industrial and hospital research laboratories. Several government laboratories and arsenals reported greatly reduced replacement needs after long wear test programs with Dynel lab coats.

The desire of workers to be well-dressed on the job is another reason for the popularity of acrylic fiber uniforms. Clothing that easily wrinkles and loses its shape is far less appealing than the newer type garments that remain neat and fresh after repeated washing and wear.

Increased wearing comfort for acrylic fiber work clothes is provided in a newly developed, durable anti-static finish.* It protects against buildup of static electricity so that garments will not "cling" to the wearer on days of low humidity.

Another significant development for the work clothes field was the recent introduction of a special new blend of 32 per cent cotton and 68 per cent Dynel, created to combine the wearing comfort of cotton with the acid-resistance and long-wear life of the acrylic fiber.

The cotton improves the fabric's moisture absorption power, minimizing the tendency of static to make garments "cling" in low humidity atmospheres, making garments more comfortable to wear under all humidity conditions. At the same time, enough Dynel is present to resist acid and alkali damage effectively and stand up under the roughest industrial treatment and frequent launderings.

It is interesting to note that a growing number of users of acrylic fiber work clothes are also using underwear made from a cotton and acrylic fiber blend. The reason, of course, is that the same acid atmosphere that will attack outerwear may also reduce the life of the worker's ordinary cotton underwear. Double protection is thus given workers against damaging effects of job conditions.

It should be emphasized that the new acrylic fiber work clothing does not protect the worker against acid burns. Regular safety procedures should be followed, such as washing affected skin area immediately upon exposure. The clothing does, however, fully protect itself from deterioration, providing economy through extra long garment life.

* Niatex AG-2, Union Carbide and Carbon Corp.

John S. McGilly is a graduate Textile Engineer from Lowell Technological Institute. He has been in the synthetic fiber field for eleven years. Prior to his present affiliation, he was with E. I. Du Pont de Nemours and Company, also the Sapphire Corporation, a hosiery concern. McGilly is now assistant sales manager, Textile Fibers Department, Carbide and Carbon Chemical Company, Division of Union Carbide and Carbon Corporation.

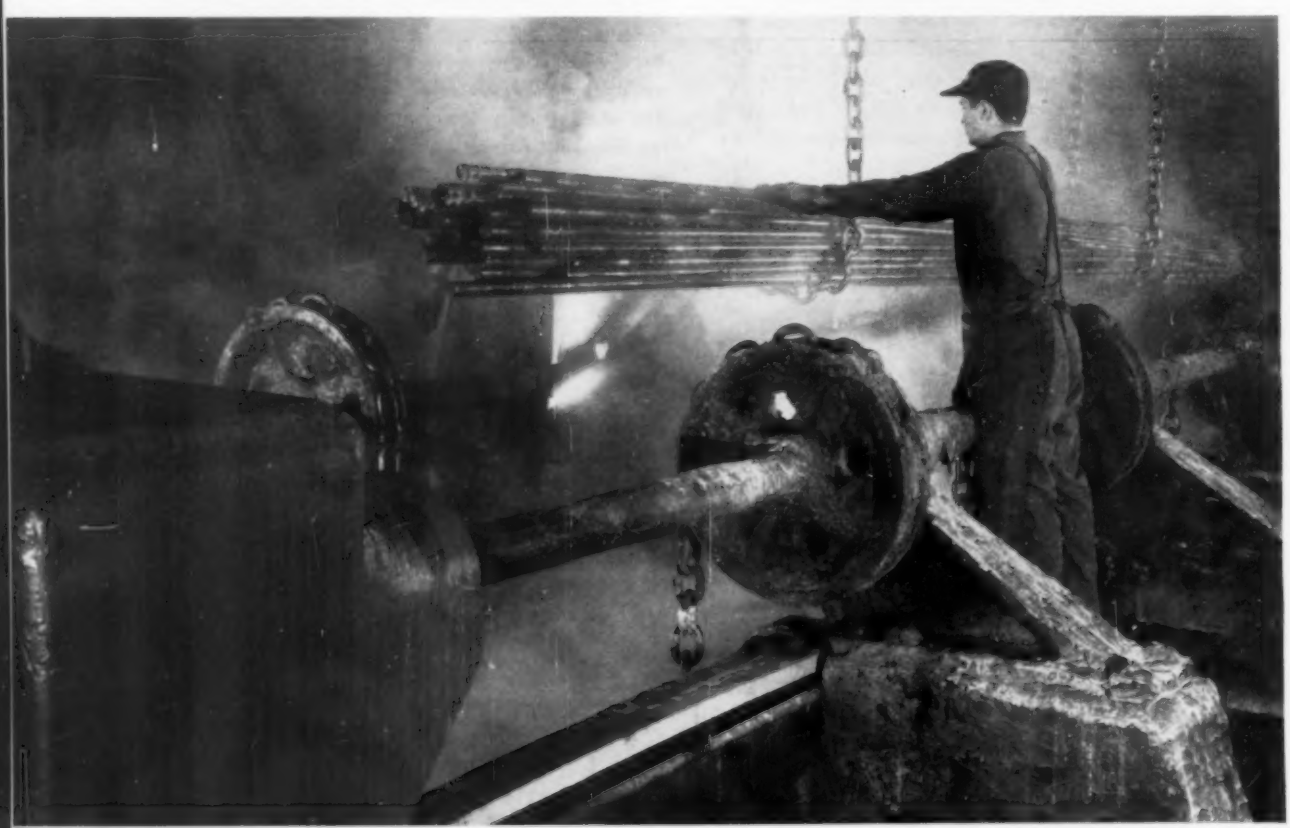
PICKLERS PLAY MUSICAL CHAIRS

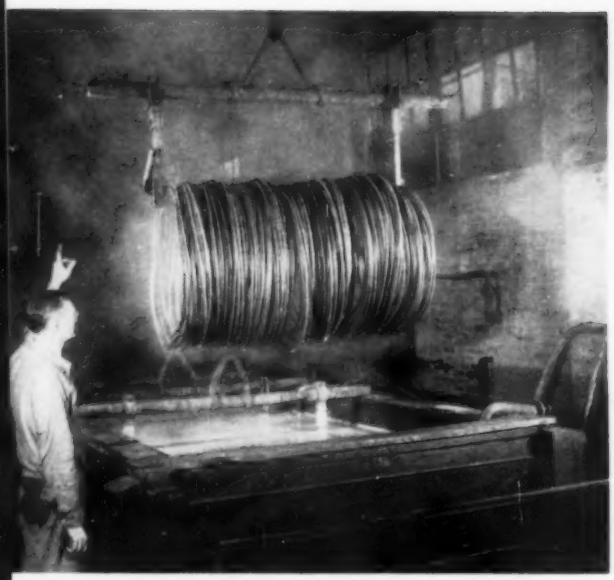
WITH ACID TANKS

TO GET LONGER SERVICE LIFE

THE PROBLEM OF WHAT to do with a wooden acid tank when it begins to leak—besides throw it away—has been solved in a rather unique way by the Superior Drawn Steel Company, Monaca, Pa. This company has a conventional wire-rod pickling line consisting of six tanks: three acid, two rinse, and one lime. When leakage becomes a problem on the acid tank, it is moved into rinse service, and then to lime in something resembling a game of musical chairs.

Five-year old sling chains lower a load of steel rods into mechanical pickler. Chains remain in acid during processing so they must be corrosion—as well as wear—resistant. Chains on pickler spricket wheels can be repaired by removing worn links and adding new ones





From acid tank, wire coils go to rinse tanks and then to lime tanks (above). This lime tank was originally used as an acid tank but was transferred when leakage became a problem. It still has its original tie-rods

Metal tie-rods on wooden acid tank get periodic retightening to keep tanks free from costly leaks. Rods usually outlast the tank

Proof of the success of this system is the fact that the wooden tank now being used for lime has been in service a total of 11 years. Normally a unit of this type would have been thrown out years ago.

This re-use is made possible by one factor: careful tie-rod selection. All wooden tanks used for pickling have metal tie-rods to keep them tight and leak-free. Material for these rods must have high tensile strength, ductility and toughness to withstand the forces of tightening and of swelling wood. Most important, the rods must have sufficient corrosion resistance to last more than the acid service life of the tank. Depending upon usage, this can range from three to seven years.

Superior Drawn Steel has standardized on Monel copper-nickel alloy for tie-rods because they offer an excellent combination of the required mechanical and corrosion resisting properties (Table I). On tanks containing hot sulphuric acid solutions, most of the rods are good for the life of the tank. In some instances, Superior has then fabricated old rods into eye bars, pickle pins or other equipment for additional pickling service.

The re-useability of Monel, even after years of corrosive service, is an important economic factor. Superior finds it could generally justify an increase in initial cost of material solely on this basis, not withstanding the increase in service life. As a result, the company now specifies Monel for many other pickling components. For example, the sling chains illustrated which are used to load and unload bar stock are made of Monel. The oldest sling chain still in daily use is five years old. It can be reconditioned to increase ultimate life simply by cutting out worn sections and adding new links since most of the chain will still be in good condition.

Similarly, "W" shaped spreaders are installed in the tank bottom of the pickler to prevent bunching of the load and assure uniform exposure of parts to the solution. The set of spreaders now in use is expected to last from six to ten years.

TABLE I
AVERAGE MECHANICAL PROPERTIES OF WROUGHT MONEL
(Composition 67 Ni, 30 Cu, 1.4 Fe, 1 Mn)

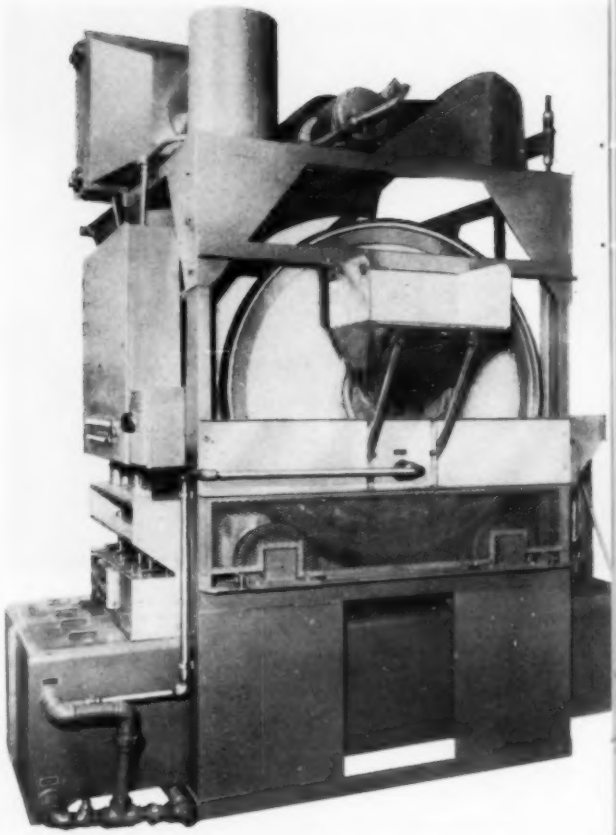
Form and Condition	Yield strength (0.2% offset) psi	Tensile strength psi	Elongation in 2 in. per cent	Hardness Brinell
Annealed	35,000	75,000	40	125
Hot-rolled	50,000	90,000	35	150
Cold-drawn	80,000	100,000	25	190

CORROSION RESISTANCE

Excellent (almost unlimited service)	Good	Poor
Sea water	HCl	HNO_3
1–20% Alkali Sol.	H_2SO_4	
Fused Alkalies	Acetic	
	Phosphoric	

NEW AUTOMATIC PLATING BARRELL HANDLES LARGE BATCHES

by NATHAN RANSOHOFF



The automatic loading and unloading tumbling barrel. Work is retained in the drum when it rotates in one direction and is automatically discharged when it rotates in the opposite direction. During the tumbling operation, work in the drum can be automatically subjected to as many processes as necessary. Design of the machine permits each processing solution to return automatically to its own tank. Processes may consist of a pickle, rinse, neutralize and rinse all in the same drum. The number of solution tanks required is determined by the number of processes. (The drier shown is mounted at top of machine. This is not required when operated in conjunction with the plating barrel)

A NEW AUTOMATIC PLATING barrel which solves many of the problems previously limiting large batch handling has been developed.* The machine makes possible important savings in labor and space for a wide range of electroplating plants.

Two features of the automatic plating barrel are of unusual interest: the barrel, which is quite large, and the electrolyte tank. These and other features, which actually were by-products of designing the machine for the handling of large batches, have resulted in significantly improved plating characteristics.

The design of this barrel eliminates the conventional non-metallic construction which had limited size of the barrel as well as current passing ability. The new construction is of rubber lined steel which gives the required structural characteristics. The current is carried to the work through buttons on the periphery of the drum, so wired that current flows only when the work is in contact with the buttons.

In physical design, as contrasted to electrical design, the barrel follows principles proved in automatic loading and unloading cleaning machines for almost 40 years. The work is held in the drum when rotating in one direction and automatically discharged when rotating in the other direction.

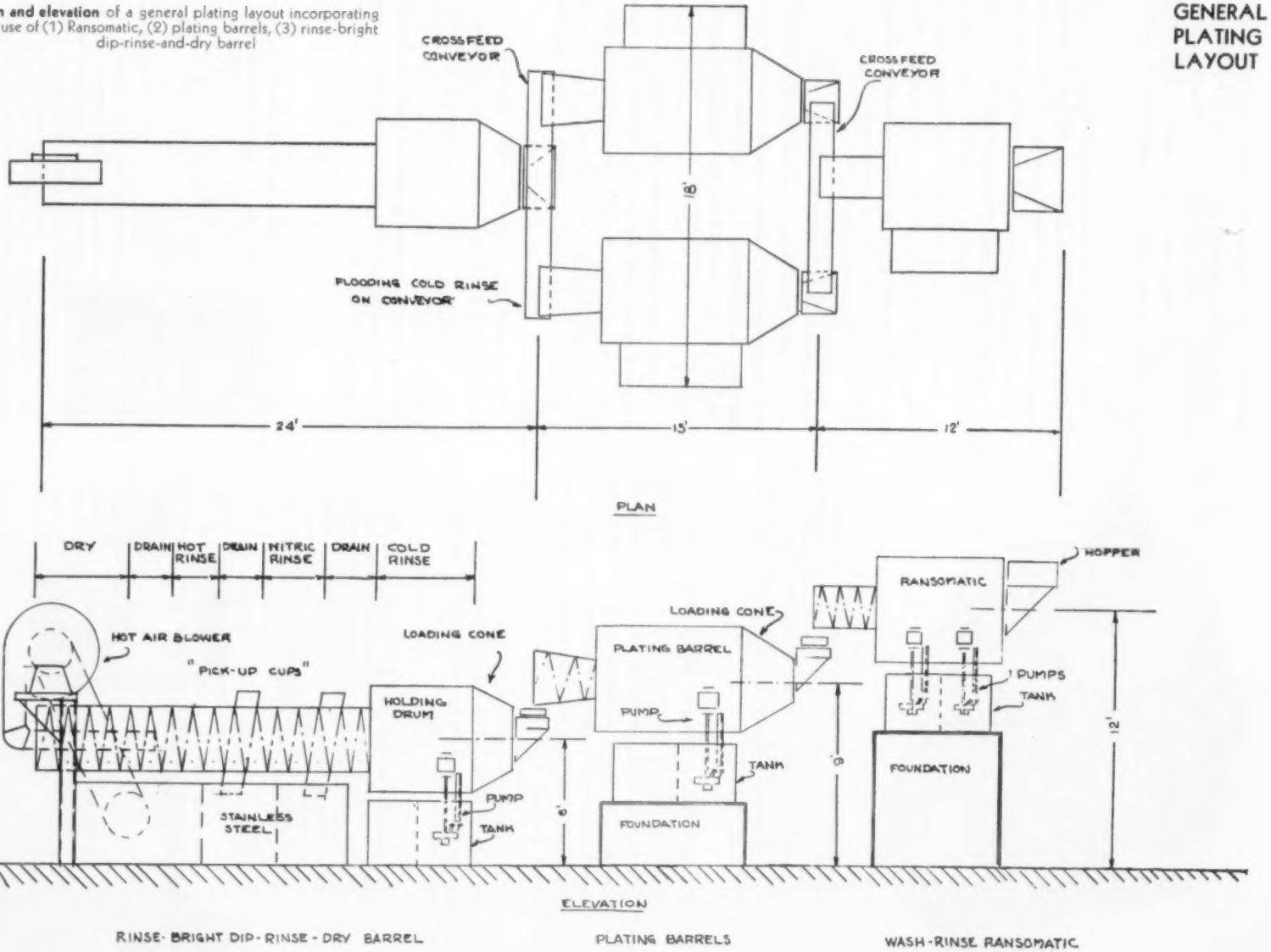
CIRCULATING ELECTROLYTE

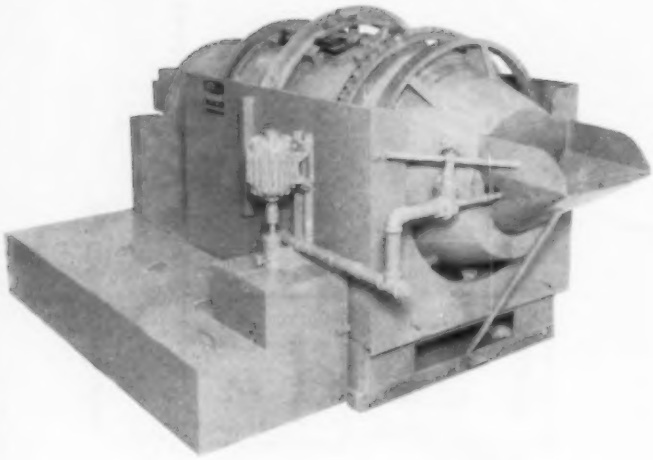
The barrel is mounted above the tank in which the electrolyte is stored. The solution is pumped from the tank

* By Ransohoff, Inc., Hamilton, Ohio.

GENERAL PLATING LAYOUT

Plan and elevation of a general plating layout incorporating the use of (1) Ransomatic, (2) plating barrels, (3) rinse-bright dip-rinse-and-dry barrel



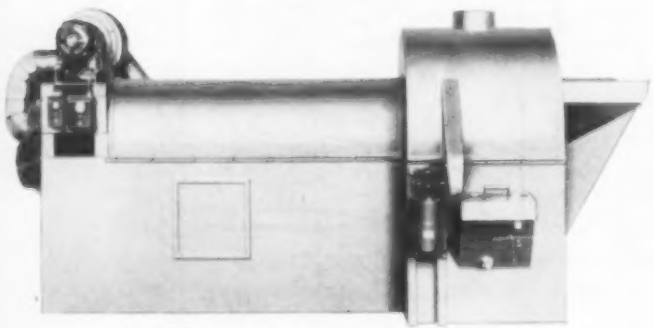


The plating barrel for automatically handling large batches. This machine is so designed that work being plated is retained in the drum when rotating in one direction and is automatically discharged when rotating in the opposite direction at the end of the pre-timed plating cycle. Electrolyte is recirculated by a vertical, centrifugal, packless pump

into the drum and circulates back to the storage tank. The pump used is a trouble-free vertical packless pump. Circulation of the electrolyte has shown a number of advantages. One, it can be filtered during circulation; two, it can be cooled by refrigeration coils in the storage tank, thus maintaining the optimum temperature, even at high current densities.

The anodes for the plating operation are contained in a steel cylinder extending through the center of the barrel. The cylinder is large enough in diameter to dip into the electrolyte which is circulating through the barrel. The anode carrier rotates with the drum and is insulated to prevent direct contact with the work. The anodes are cubes or balls rolling loose inside the carrier. This action prevents the formation of bubbles and keeps the anodes clean.

The rinse-bright dip-rinse-dry barrel receives the work from the plating barrel after it has been plated to the required thickness. This barrel is a continuous drum-type machine with a holding drum at the receiving end so that a complete batch may be charged into it and fed through a cycle of rinsing, bright dripping, rinsing and drying. Operation of this machine is completely automatic so that large batches may be handled with a minimum amount of labor



The operation of the automatic plating barrel is extremely simple. The batch of parts is charged in the loading hopper and the "start" button pressed. The drum starts rotating, electrolyte is circulated through the drum and the plating current flows. An adjustable timer can be used to control the length of the plating operation. When the pre-set time interval expires, the drum stops and reverses. The electrolyte and current stop flowing. With the reversal of the drum, the plated parts automatically discharge.

SINGLE AUTOMATIC OPERATION

In a typical installation, the automatic plating barrel may be preceded by a drum-type Ransomatic which automatically tumble-washes, pickles, rinses, neutralizes, rinses, and drains before automatically discharging into the plating barrel.

The automatic plating machine may be followed by an automatic rinse, bright dip and dry machine. The three machines can be integrated into a single automatic operation, with each machine feeding the batch of parts to the following machine, saving considerably on labor and floor space as well.

The automatic plating barrel is widely adaptable to any job in which there are large batches of comparatively small parts. It can, for a specific example, replace the trouble, expense and labor of hot galvanizing nails. Wet-tumbled nails can be loaded in the charging end and not handled until they come out of the final drier for packaging in kegs or cartons.

Nathan Ransohoff, founder more than 40 years ago and late chairman of the board of Ransohoff, Inc., Hamilton, Ohio, was widely known as the "Grand Old Man" of the company and "father" of most modern metal surface treatment methods.

Upon graduation from Massachusetts Institute of Technology, Ransohoff began his long and colorful career in the metalworking industry. His personal inventive genius was responsible for the development of many processes and the building of many types of equipment. Significantly, the "Who's Who" members of the American metalworking industry always showed vital interest in Ransohoff's new methods. His passing is a loss to the industry.

Selected Abstracts of Technical Papers Delivered at the Association of Iron and Steel Engineers Convention Cleveland, Ohio, September 25-28, 1956

Types of Defects and Their Occurrence, Part I of a two-part "Study of Factors Influencing Surface Staining of Cold Rolled Steel," by C. R. Lillie, Research Metallurgist, and D. W. Levinson, Supervisor, Non-ferrous Metals Research, Armour Research Foundation of Illinois Institute of Technology, Chicago, Illinois.

One of the major surface defects of annealed cold rolled steel is a narrow gray to black zone of stain appearing near and parallel to each edge of a coil, and separated from the edge by a bright area about ½ to 1 inch wide. This black band, known variously as "snaky edge," "edge smudge," "carbon edge," or "shadow edge," renders the strip unsuitable for terne plating, certain types of galvanizing, or lacquering. Despite its common occurrence, mill variables are so numerous and difficult to control that the cause and cure of this defect had not been completely established.

The experimental attack consisted first of establishing conditions under which the defect is formed and, second, of discovering the combination of factors by which the defect might be removed from the sheet surface.

It was found that snaky edge formed independently of variations in the type and amount of rolling oil and/or detergents. Also, the reaction was shown to occur on a strip surface that had been mechanically and chemically cleaned, indicating that the presence of surface impurities carried over from continuous pickling and cold rolling was not required for the formation of the defect.

The sharpness of the demarcation line between the dark and bright areas found on both commercial and experimental material indicates a temperature-dependent chemical reaction. The location of the defect near the edge of the coiled strip may be thought of as the result of a combination of temperature gradient from edge to center of the coil and of limited access of the annealing gas. It has been demonstrated that a temperature gradient is more important than a definite temperature of formation.

The resistance of the black area to reduction by DX gas and by hydrogen gives a clue to its persistence throughout the long annealing process, and implies that the defect is formed on the heating cycle.

It is concluded that the composition, header pressure and rate of flow of the annealing gas are the commercially controllable factors by which the formation of the defect may be minimized (increase of the CO_2/CO ratio, decrease of the dew-point, and/or increase of the header pressure and flow rate).

Solvent Degreasing—A Valuable Industrial Cleaning Process, by W. L. McCracken, Director of Research, Detrex Corporation, Detroit, Michigan.

In order to fully understand the process of solvent degreasing and its application in modern metal cleaning, it is necessary to know the basic fundamentals governing the design of the process. It is also necessary to know something about the various operating cycles which may be employed, depending upon the type of work to be cleaned, types of soils to be removed, and methods of material handling which is to be employed. These basic fundamentals are explained and shown graphically by illustrations.

Equally important is a knowledge of why certain solvents are employed in modern solvent degreasing practice and why they have been selected as superior degreasing solvents. Characteristics of solvents suitable for use in solvent degreasing equipment are discussed.

A cleaning process should be thorough, economical and safe. The solvent degreasing process is one of the most economical and one of the safer processes which can be applied to metal cleaning. Economics and safety are discussed in detail. The process is most adaptable and can be used as a hand-operated process or can be applied to the most complicated production lines including strip cleaning lines. It is flexible and can be used in connection with other cleaning aids, such as the application of ultrasonic energy to the cleaning cycle.

Identification and Reaction Mechanisms, Part II of a two-part "Study of Factors Influencing Surface Staining of Cold Rolled Steel," by F. Schossberger, Senior Scientist, K. Hattori, Research Chemist, and H. Marver, Assistant Chemist, Armour Research Foundation of Illinois Institute of Technology, Chicago, Illinois.

The effect of a DX gas atmosphere on the staining of steel coil edges in annealing ovens is studied. Black

edges of coils in various steel mills were investigated by electron microscopy, x-ray diffraction and electron diffraction. One or more of the following substances were found: carbon, a variety of oxides and oxy-hydrates of iron, and iron carbides.

At 750 C, DX gas removed black edges on only some of the samples. Chemical tests and electron diffraction data also indicated that different types of black exist.

Laboratory experiments indicated that the space between steel sheets, temperature, flow rate, and gas direction, all influence the appearance and extent of the stains or deposits on the steel surface. Excessive amounts of rolling oil can alter the appearance of the stain.

Depending upon the annealing conditions, carbides, carbon, or iron oxides are formed in different proportions by catalytic reaction of the iron surface with the DX gas.

Stopping Corrosion by the Use of Rust Preventive Compounds, by R. P. Mills, Manager, Rust Preventive Division, Valvoline Oil Company, Division Ashland Oil & Refining Company, Freedom, Pa.

Corrosion is an ever present enemy which is attacking our metallic wealth with ever increasing ferocity and destroying billions of dollars of manufactured items each and every year.

There are several ways to fight this attack, principally by painting, plating, chemical treatments, porcelain enameling, vapor phase inhibitors, and specially prepared oils, greases and solvent mixtures.

In order to fight corrosion, it is necessary to understand the simple basic features of electro-chemical corrosion. In order for corrosion to proceed, there has to be set up an electro-chemical cell consisting of four parts.

1. Anode.
2. Cathode.
3. Electrolyte.
4. Connecting circuit.

The purpose of any protective coating is to interfere with the above mentioned electro-chemical cell.

In the processing of manufactured goods produced by steel mills, economy is of prime importance because of the tonnage involved. An economical way to prevent corrosion (rusting) is by the use of special types of rust inhibited oils, greases or solvent dispersions.

The Department of Defense has been one of the prime movers in the development of rust preventive compounds and much is owed to such laboratories as the U. S. Naval Engineering Experiment Station, Naval Air Material Command, Wright-Patterson Air Force Base and Rock Island Arsenal. Their work during the war and after has led to many improved test evaluation methods, packaging procedures and new protective coatings.

The laboratory personnel use such accelerated test methods as the salt spray, humidity cabinet and weather-o-meter. These tests are at the best good screening methods, and the "acid" test of any protective coating is actual mill or field experience.

Rust preventives do stop corrosion (rust) and can save money.

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Though the submission of any such papers by AES members or non-members will be welcomed by PLATING any time during the year, this current period is particularly recommended. So as to expedite review and other processing, please write the Editor, PLATING, 445 Broad Street, Newark 2, New Jersey, for full particulars before submitting your manuscript.

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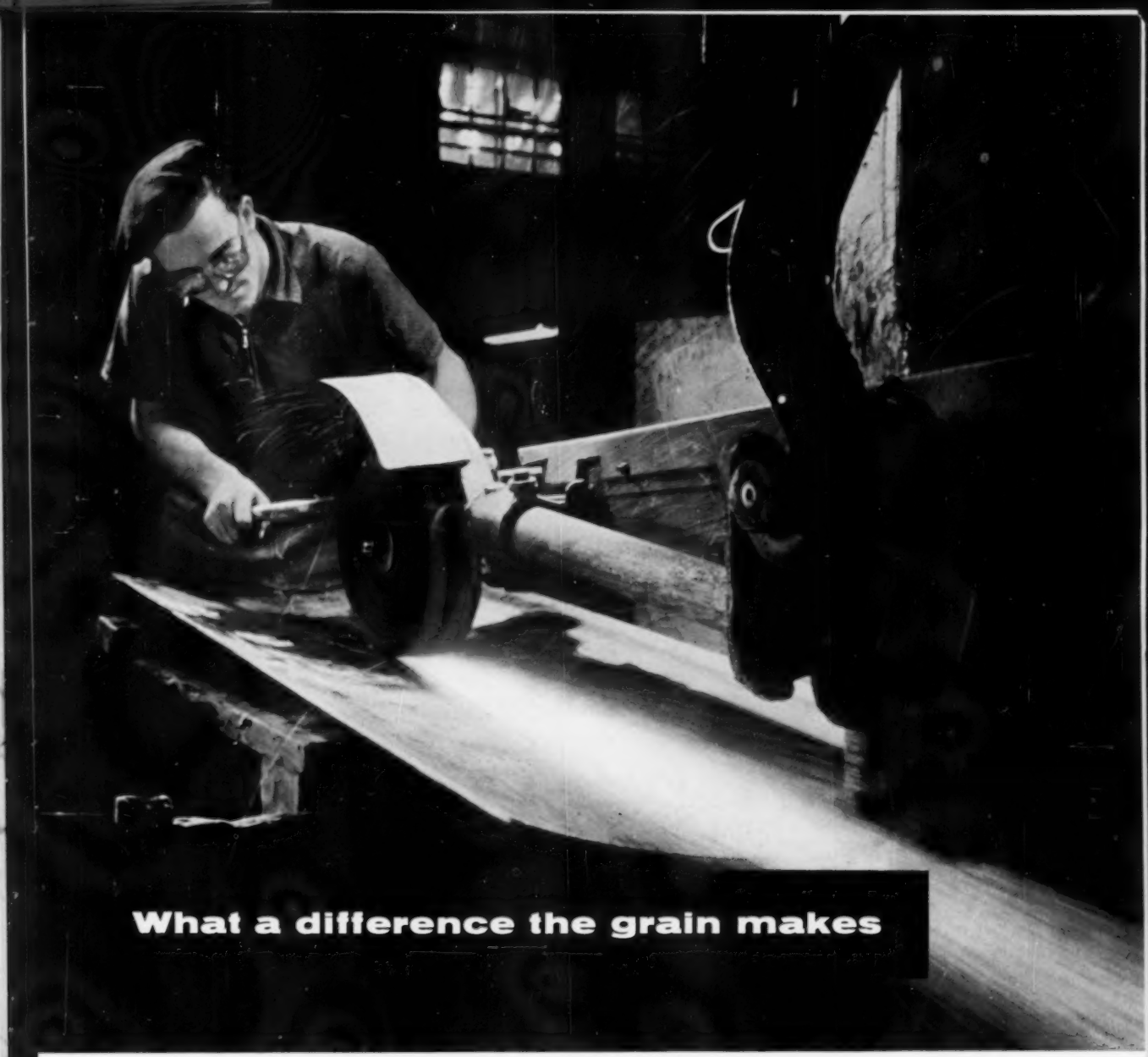

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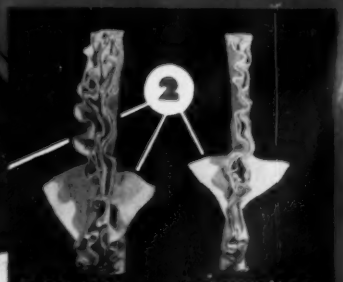

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BOOKS

American Society for Testing Metals Special Technical Publication No. 174. Heavy paper cover, 200 pp., $3.50; AES members, $3.15

The demand of engineers to attain greater efficiency in heat engines has created a need for metals to withstand the increase in operation temperatures. Steam power plant design engineers are pushing temperatures and operating pressures beyond the safe operating limits of the ferritic steels now in use, and the gas turbine engineers (and those concerned with devices such as guided missiles) are prepared to design for operation at temperatures higher than the 1600 F limit to which they have been confined for want of materials capable of satisfactorily withstanding higher temperatures of operation. This symposium, sponsored by the General Research Panel of the ASTM-ASME Joint Committee on Effect of Temperature on the Properties of Metals, attempts to provide a basis of evaluation of a number of metallic materials, including cermets, which have been undergoing study in laboratories both here and abroad, to determine their suitability for higher temperature service. The papers discuss as many as possible of the properties—physical, chemical and mechanical—as well as methods of combating surface deterioration that are affected by temperature.

Vacuum Deposition of Thin Films by L. Holland. 566 pp.; $10.00; AES members, $8.50

The new book is primarily concerned with plant design, film production, and the physical properties of thin films, all of basic importance regardless of the particular purpose for which the film is required.

Maintaining a critical approach, the author also injects the practical opinions garnered from his direct experience. The topics he covers are: vacuum evaporation; the degassing of plastic material *in vacuo;* durability of vacuum deposited layers and surface cleaning apparatus; vapor sources; emission characteristics of vapor sources and film thickness distribution; evaporation techniques for a range of metals and alloys; preparation of thin films for electrical purposes; optical interference films; apparatus for the controlled deposition of interference films; evaporated aluminum films; evaporated coatings on plastic materials and lacquered components; shadow-casting and surface replication; cathodic sputtering; preparation of metal oxide films; and the preparation and properties of a range of oxide films.

In the sections dealing with apparatus design, Mr. Holland considers the subject only in relation to the needs of evaporation and sputtering plant used for coating either glass or volatile substrates. His discussion of vapor sources goes into the use of heater materials other than the customary tungsten spirals, and to the vapor intensity distribution of the different types of source described.

The Electrodeposition of Titanium (3 vols.) PB-111797, Part 1, 57 pages; PB-111798, Part 2, 57 pages; PB-111794, Part 3, 59 pages; each $1.50

Air-Force-sponsored development of an effective method for the electrodeposition of titanium is described in a three-part report available for industry use through the Office of Technical Services, U. S. Department of Commerce.

In Part 1, numerous experiments on the electrolysis of both fused salt and aqueous systems are reported. A procedure is described which yielded a thin but coherent and corrosion resistant titanium in aqueous electrolytes.

Part 2 reports development of a method for obtaining high-content diffusion coatings of titanium by immersing a metal in a fused chloride bath in close proximity to solid plates of titanium or a concentration of titanium powder. Variables in the process are described, and data are presented on corrosion of titanium in fused salts, the resulting products, and the probable mechanism.

Part 3 describes modification of the coating procedure to a more effective and reproducible process by introduction of small controlled amounts of oxygen into the fused chloride bath. It is shown that the coating mechanism was only partially due to the formation of titanium lower chlorides. Coatings were also obtained by deposition from the vapor state, using iodide or chloride vapors. Physical properties of the coatings are described.

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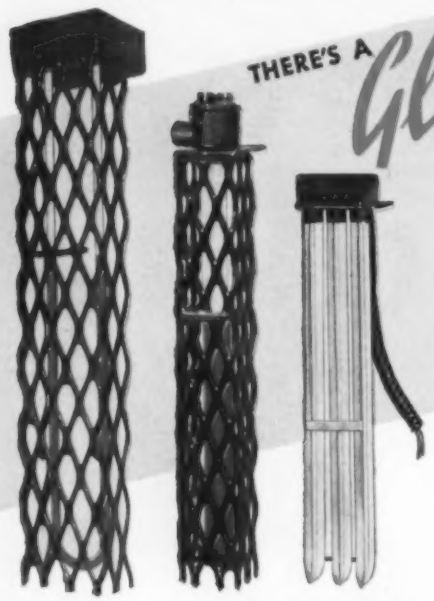

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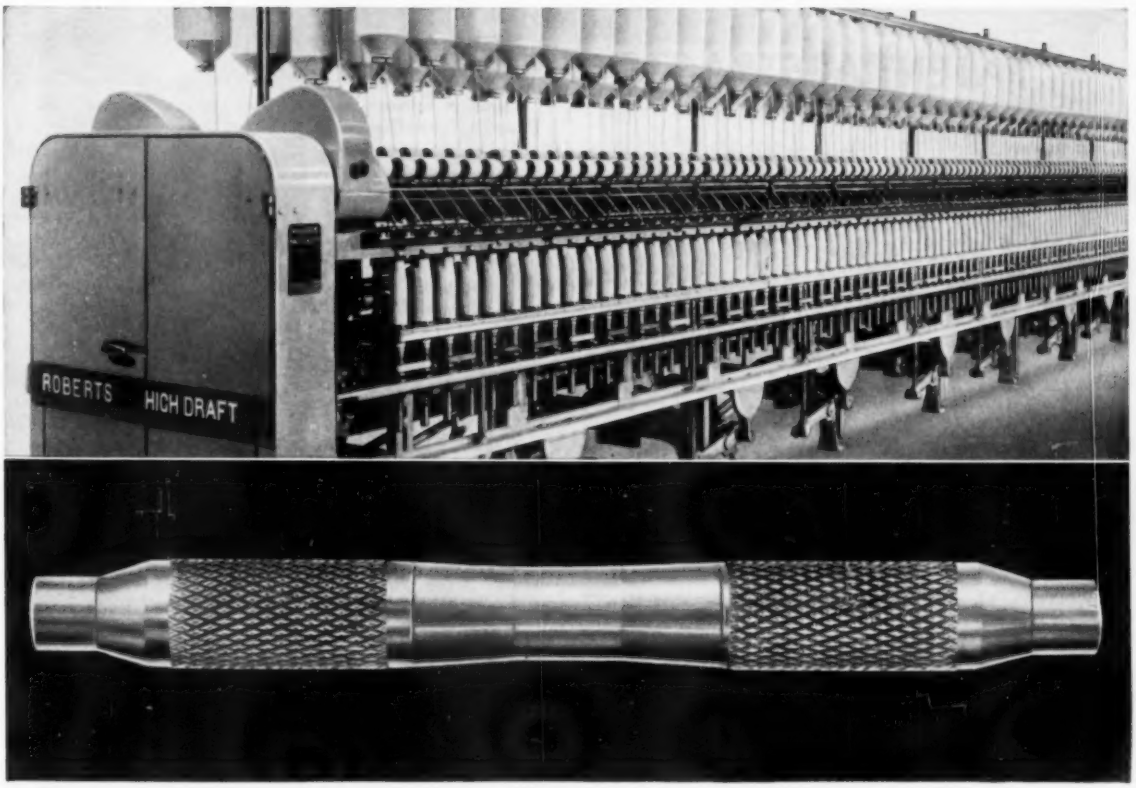

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PATENT ABSTRACTS

DR. D. GARDNER FOULKE
Manager, Electrochemical Development
Hanson-Van Winkle-Munning Co
Matawan, New Jersey

Copies of patents may be obtained by writing to Commissioner of Patents, Washington, D. C. Price 25 cents each.

No. 2,746,920, May 22, 1956—Waste Pickle Liquor Disposal—J. Wunderley, Liberty, Pa.

The use of granulated basic ferrous slag to dispose of waste pickle liquor is described. Patent No. 2,746,919 with 5 claims describes an apparatus for use with this method.

4 claims.

No. 2,748,035, May 29, 1956—Method for Cleaning Containers Containing Aluminum and Tin—S. Duncan, assignor to Detex Corp., Detroit, Mich.

The method consists of immersing the backing container made of aluminum or tin and their oxides in a boiling solution of 3–8 per cent chromate, 4–20 per cent silicate and 2–8 per cent ferricyanide.

3 claims.

No. 2,748,066, May 29, 1956—Process of Enameling Steel—I. Whitehouse et al, assignors to Republic Steel Corp., Cleveland, Ohio.

A method of enameling eliminating the use of adherence promoting oxides, consists of removing 0.01 g/sq in of metal from the strip (anodic sulfuric acid, sand blasting, or nitric acid) followed by rinsing acid dipping, etc. and finally plating in a Watts' bath for 13 seconds at 40 asf and 120°–160° T.

11 claims, figure.

No. 2,748,067, May 29, 1956—Processing Plated Parts—M. Pease and J. Jasionis, assignors to Sylvania Electric Products Co., Mass.

Claim 1 describes a method of processing a plated metal part to be exposed to the interior of an electric discharge device as including the steps of electroplating the part of a base metal with a porous layer of a different metal whose melting temperature is lower than that of said base metal, heating the plated part in a vacuum at a temperature sufficient to remove the gases without sintering the plating, thereafter raising the temperature to sinter the plating while maintaining a vacuum of high order.

9 claims.

No. 2,748,068, May 29, 1956—Composition and Process for Electroplating Bright Nickel—C. Faust and W. Safranek, assignors to Rockwell Spring and Axle Co., Coraopolis, Pa.

As addition agents for bright nickel plating, the patentee claim the use of at least 2 g/l sulfonated phthalide or naphthalide and 0.1 to 1.0 g/l of a metal such as zinc cadmium and thallium.

8 claims.

No. 2,748,069, May 29, 1956—Trivalent Chromium Plating Solution—J. Icxi, Paris, France.

A chromium plating bath of a pH of about 7 contains a complex salt of trivalent chromium corresponding to:

$$Cr\ (acid)\ 6/n\ (Amine)_3$$

where,

acid = at least 1 organic carboxylic acid of less than 6 carbons

n = number of carboxylic groups in acid radical

Amine = ammonia of amine (six or less carbons) radicals

Example I describes use of 700 g/l of Gregory salt $[Cr(C_2O_4)_3](NH_4)3$. Formates, oxalates and various amines are mentioned.

13 claims.

No. 2,748,549, June 5, 1956—Method of Coating Relatively Small Metallic Parts—J. N. Tuttle, Newtonville, Mass.

The parts are placed in a drum having inner and outer foraminous walls. The parts are packed to provide a slight degree of freedom which is insufficient to provide tumbling. The double drum is then rotated through the chemical solutions.

2 claims, figure.

No. 2,748,784, June 5, 1956—Bath Structure for Treating Wire in the form of a Helical Coil—H. Kenmove and W. Manson, assignors to National Standard Co., Niles, Mich.

The improvement, over an earlier patent describing the processing of wire by moving the helex forward, consists of providing a series of treating tanks the structure of which is described.

2 claims, figure.

No. 2,749,293, June 5, 1956—Method of Making Molds for Thermoplastics—T. Winstead, assignor to Hedwin Corp., Baltimore, Md.

The method consisting of making the design in the flat, forming into a cylinder, plating the inside of the cylinder and finally vaproblasting off the woven web which was the base for the electroform.

5 claims, drawing.

No. 2,749,295, June 5, 1956—Electrolytic Production of Titanium—K. Svanstrom and W. Opie, assignors to National Lead Co., New York, N. Y.

A method for producing titanium by electrolysis of fused salt bath (alkali and alkaline earth metal halides into which titanium tetrachloride is introduced near the cathode continuously) is described.

4 claims, figure.

No. 2,749,296, June 5, 1956—Process for Recovery of Beryllium Oxide—T. Banerjee and P. Cahkravarty.

The oxide is formed in a diaphragm cell containing a beryllium-sodium fluoride electrolyte at 0.94–6.3 amp/dcm^{-2} on cathode.

6 claims.

No. 2,749,299, June 5, 1956—Anode Core—R. Wheeler, Tulsa, Okla.

The anode has an axial cavity in one end and a length of wire imbedded in the anode. At the outer end the wire spiral is in tightly engaged convolutions and sealed in with solder and a plastic filler.

2 claims, figure.

No. 2,749,300, June 5, 1956—Apparatus for Electrolytically Cleaning Lamp Stem Lead Wires—C. Thomas, assignor to General Electric Company, Schenectady, N. Y.

A method involving magnetic mounting and jet solution cleaning for the lamp lead wires electrolytically is described.

1 claim, figure.

No. 2,749,669, June 12, 1956—Finishing Device—M. Sluper, assignor to Mecha-Finish Corp., Sturgis, Mich.

This device consists of a rotatable container for abrasive fluid, a carrier rotatable above said container about an axis inclined relative to the rotation of the container with a number of work holders inclined relative to the carrier axis.

13 claims, figure.

A Timely Message on

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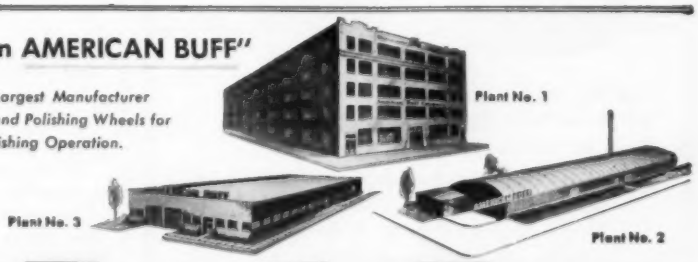

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PATENT ABSTRACTS

No. 2,754,226, July 10, 1956—Atomizing Coating System—J. Juvinall, assignor to Ransburg Electro-Coating Corp., Indianapolis, Indiana.

An electrostatic coating apparatus is described as is one in No. 2,754,277 (11 claims) granted Ransburg. See also No. 2,754,228 (4 claims) granted Bede for spray printing heated paint.

13 claims, figure.

No. 2,754,225, July 10, 1956—Spray Coating With Metals—F. Gfeller, assignor to M. Von Schulthess, Zurich, Switzerland.

The metal to be sprayed is heated wire in a gun by a gaseous fuel and a primary electron field is generated between work and wire with a secondary field extending over a distance less than the primary field. The primary field is of high frequency, high current and low potential while the secondary is of high frequency and potential but of low current.

3 claims, drawing.

No. 2,753,248, July 3, 1956—Device for Detecting Hydrogen Cyanide—J. Johnson and E. Poor, assignors to U. S. A. (Dept. of Navy).

An indicator capable of determining amounts of HCN in air as low as 0.01 mg/l consists of paper impregnated with a basic reacting alkali metal compound and with an aromatic carbonyl compound having at least one nuclear carbonyl group in para position to a nitro group. Said indicator when wet with an organic liquid, being capable of changing color in presence of HCN.

10 claims.

No. 2,752,667, July 3, 1956—Bearings—R. A. Schaefer, et al, assignors to Clevite Corp., Cleveland, Ohio.

An arcuate body consisting of a steel strip united to a ductile, cast aluminum alloy through a bonding layer of nickel (0.00025–0.001") plated on the steel is described.

4 claims, figure.

No. 2,752,732, July 3, 1956—Apparatus for Treating Surfaces of Work Pieces—Leon Walker, Brooklyn, New York.

A tumbling barrel with an impeller mounted for rotation beneath said barrel and positioned for hurling a stream of pulverulent material upwardly at said barrel.

7 claims, drawing.

No. 2,753,282, July 3, 1956—Insulating Coat on Steel—P. Perry, assignor to Allegheny-Ludlum Steel Corp., Brackenridge, Pa.

The steel is treated with a solution consisting of water 100 parts by weight containing as the solute:

1° Magnesium phosphate, 5–75 parts by weight
Mono basic NH_4 phosphate, 10–135 parts by weight
Chromium acid, 1–6 parts by weight

after which the film formed is baked.

8 claims.

No. 2,753,298, July 3, 1956—Method and Apparatus for Continuous Plating—W. Gray, assignor to Pittsburgh Plate Glass Co., Allegheny Co., Pa.

The equipment described primarily is for the plating of silvered glass sheets with copper to provide the necessary protective coating for high quality mirrors. The silvered sheet is passed continuously horizontally beneath an anode plate located sufficiently close to the glass sheet so that there is only a small distance between them and into which is circulated the plating bath.

7 claims, 3 figures.

No. 2,753,299, July 6, 1956—Electroplating with Antimony—R. Ehrhardt, assignor to Bell Telephone Laboratories, Inc., New York, N. Y.

The plating of germanium with antimony is accomplished by immersing the germanium body and at least one antimony anode in solution of antimony (15–25 g/l) in aqueous potassium hydroxide at 190°–200° F at 350 to 700 milliamperes per square inch of the germanium surface.

1 claim.

No. 2,753,301, July 3, 1956—Electropolishing Copper—F. Bersworth, et al, assignors to Dow Chemical Co., Midland, Michigan.

Copper and copper base alloys may be electropolished in a bath consisting essentially of an alkali metal salt of an alkylene polyamine carboxylic acid (e.g. EDTA, 20–34 per cent) an inorganic acid to adjust the pH to about 4 (e.g. phosphoric acid) and a non-electrolyte (e.g. glycol, 5 per cent).

10 claims.

No. 2,752,302, June 26, 1956—Process for Treating Aluminum Work Pieces—P. Magarus, assignor to Warren Alloy, Warren, Michigan.

The process consists of filling the tiny pores of an aluminum coating under pressure with tung oil, after which the excess oil is removed. The tung oil is then polymerized in situ in the pores after which the object is plated with a corrosion-resistant metal.

4 claims, 3 figures.

No. 2,752,268, June 26, 1956—Process of Making Aluminum Coated Ferrous Bodies—M. Whitfield and V. Sheshunoff, assignors to Whitfield and Sheshunoff, Inc., Garden City, New York.

The process involves dipping the ferrous base into molten aluminum, the novelty being the carbon steel base contains 1 per cent molybdenum or tungsten:

U. S. patent No. 2,752,265, granted same inventors describes (1 claim) the preparation of an aluminum coating of uniform porosity.

3 claims.

No. 2,752,299, June 26, 1956—Electrolytic Production of Manganese—H. Cooper, assignor to W. Weil, Shaker Heights, Ohio.

Iron content of manganese ores is removed by reaction with chlorine followed by volatilization. The manganese and small amounts of iron are finally deposited from a fused alkali metal chloride bath.

In U. S. patents No. 2,752,300 and No. 2,752,301 the same inventor describes similar processes for titanium and chromium while No. 2,752,301 is more general.

18 claims, figure.

No. 2,752,304, June 26, 1956—Electrolytic Polishing of Metals—E. Darmois and I. Epelboin, assignors to Centre National de la Recherche Scientifique, Paris, France.

The bath for electropolishing metal consists of a solution of a salt of perchloric acid in ethyl alcohol (80–92 per cent). The cation of the perchlorate must satisfy the inequality $r_s > r_c$ where r_s is the radius of the cation in solution and r_c the radius of the cation in the solid state (Na, Ag, Fe, Mg, and Al mentioned). The bath is useful for the 4th series of group VIII metals of Mendeleef's periodic table.

2 claims, 3 figures.

No. 2,752,305, June 26, 1956—Electrolytic Polishing of Metals—H. Turner, assignor to Union Carbide and Carbon Corp., New York, N. Y.

The electropolishing can be done by immersing the article in a bath of phosphoric acid (45–80 per cent), sulfuric acid (5–20 per cent) and 1–5 per cent of a phosphoric acid ester of a polyhydric alcohol or a salt of said ester. The acids may only comprise 90 per cent by weight of the bath, therefore 5–9 per cent water is present.

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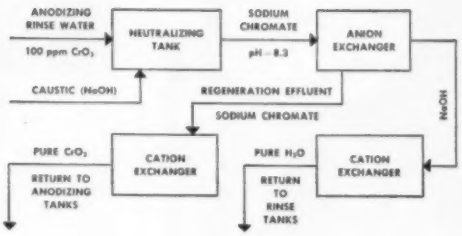

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158. ADHESION

a. *STUDY OF BONDING FUNDAMENTALS.*
Horace R. Ogden, James E. Reynolds, James B. Melehan and Robert I. Jaffee.
Battelle Memorial Institute (U. S. Atomic Energy Commission), BMI-1101, June 1956, 29 p.

159. AMERICIUM

a. *AMERICIUM ELECTRODEPOSITION.*
Roy Ko.
Nucleonics, *14*, July 1956, p. 74.

160. ANALYSIS

a. *ANALYSIS OF NICKEL IN PLATING BATHS.*
Frank Brako.
Metal Finishing, *54*, No. 9, September 1956, p. 61–64.

161. ANODIZING

a. *ANODIZED COATINGS FOR ALUMINUM.*
R. V. Vanden Berg.
Materials & Methods, *44*, No. 1, July 1956, p. 90–94.

b. *SURFACE TREATMENT AND FINISHING OF LIGHT METALS. PART XI. PROPERTIES OF ANODIC COATINGS.*
S. Wernick and R. Pinner.
Metal Finishing, *54*, No. 9, September 1956, p. 56–60.

162. CHROMIUM

a. *CHROMIUM DIFFUSION AND ITS APPLICATION TO SHEET-METAL PARTS.*
R. L. Samuel and N. A. Lockington.
Sheet Metal Industries, *33*, No. 351, July 1956, p. 447–454.

163. CLEANING

a. *USE OF ULTRASOUND IN CLEANING METAL SURFACES.* (*Czech*).
J. Rones.
Strojirenska Vyroba, *4*, No. 4, April 1956, p. 162–163.
Note: Ultrasound considerably accelerates degreasing of metal surfaces, particularly in organic solvents. Ultrasonic cleaning equipment.

164. CORROSION

a. *REPORT OF SUBCOMMITTEE VI. OF COMMITTEE B-3, ON ATMOSPHERIC CORROSION.*
H. R. Copson, chairman.
Paper from "Symposium on Atmospheric Corrosion of Non-Ferrous Metals." ASTM Special Publication No. 175. American Society for Testing Materials. p. 3–19.

b. *ATMOSPHERIC GALVANIC CORROSION OF MAGNESIUM COUPLED TO OTHER METALS.*
H. O. Teeple.
Paper from "Symposium on Atmospheric Corrosion of Non-Ferrous Metals." ASTM Special Publication No. 175. American Society for Testing Materials. p. 89–115.

c. *THE USE OF LEAD AND TIN OUTDOORS.*
George O. Hiers and Elbert J. Minarcik.
Paper from "Symposium on Atmospheric Corrosion of Non-Ferrous Metals." ASTM Special Publication No. 175. American Society for Testing Materials. p. 135–140.

d. *CHROMIUM CHEMICALS IN CORROSION PREVENTION.*
H. A. H. Pray.
Paper from "Chromium," Vol. I. Chemistry of Chromium and Its Compounds. Monograph Series No. 132. Rheinhold Publishing Corp., p. 343–356.

e. *AN APPROACH TO THE CORROSION PROBLEM.*
Anton DeS. Brasunas.
Corrosion Technology, *3*, No. 8, August 1956, p. 261–265.

f. *THE RELATION OF THIN FILMS TO CORROSION.*
Thor N. Rhodin.
Corrosion, *12*, No. 9, September 1956, p. 465–475.

g. *STEEL SURFACE PROPERTIES AFFECT INTERNAL CORROSION PERFORMANCE OF TIN PLATE CONTAINERS.*
A. R. Willey, J. L. Krickl and R. R. Hartwell.
Corrosion, *12*, No. 9, September 1956, p. 433–439.

165. DISTRIBUTION OF PLATING

a. *FINISHING POINTERS. PLATING ON EDGES AND CORNERS.*
J. B. Mohler.
Metal Finishing, *54*, No. 9, September 1956, p. 65.

166. ELECTROPLATING

a. *LESS COMMON METALS AND ALLOYS. ELECTRODEPOSITION FROM AQUEOUS SOLUTION.*
M. L. Holt.
Metal Finishing, *54*, No. 9, September 1956, p. 48–55.

b. *WHAT TO CONSIDER IN SPECIFYING ELECTROPLATES.*
Materials & Methods, *44*, No. 1, July 1956, p. 118–132.

167. FLAME SPRAYING

a. *FLAME SPRAYING OF METALS AND PLASTICS.*
G. R. Lawrence.
Corrosion Technology, *3*, No. 8, August 1956, p. 254–257.

168. METALLURGY

a. *HOW METALS PERFORM UNDER REPEATED IMPACT.*
E. L. Layland.
Materials & Methods, *44*, No. 1, July 1956, p. 104–105.

169. MISCELLANEOUS

a. *MORE JOBS FOR PLATING.*
Steel, *139*, July 16, 1956, p. 136–138.

b. *MACROSCOPIC AND MICROSCOPIC PLATING SURFACE IN THE ELECTROPLATING BATH.* (*Norwegian*).
Einar Snekvik.
Teknisk Ukeblad, *103*, No. 25, June 21, 1956, p. 566–573.

c. *THE STRUCTURE AND GROWTH OF ELECTRODEPOSITS.*
H. Wilman.
Paper from The Journal of the Imperial College Chemical Engineering Society, p. 96–112.

170. ORGANIC FILMS

a. *ELECTROCHEMICAL STUDIES OF PAINT FILMS ON METALS.*
Miss D. M. Brasher.
Electroplating and Metal Finishing, *9*, No. 9, September 1956, p. 280–284.

171. PALLADIUM

a. *ELECTROPLATING OF PALLADIUM.* (*German*).
Edmund R. Thews.
Metalloberfläche, *10*, No. 7, July 1956, p. 193–196.

172. PHOSPHATING

a. *OXIDISING AND PHOSPHATING PRACTICE IN THE U.S.S.R.*
H. A. Holden.
Electroplating and Metal Finishing, *9*, No. 9, September 1956, p. 291–292.

173. PLATINUM

a. *ELECTROCLADDING OF ZIRCONIUM WITH PLATINUM.*
Arch B. Tripler, Jr., John G. Beach and Charles L. Faust.
Battelle Memorial Institute (U. S. Atomic Energy Commission), BMI-1097, June 1956, p. 11

174. RECTIFIERS

a. *SCIENCE FOR ELECTROPLATERS. 17. RECTIFIERS.*
L. Serota.
Metal Finishing, *54*, No. 9, September 1956, p. 66–69.

175. RHODIUM

a. *THE ELECTROLYTIC DEPOSITION OF RHODIUM.* (*German*).
J. Fischer and F. Leonhard.
Metall, *10*, No. 13–14, July 1956, p. 608–617.

176. TIN

a. *SPECULATIONS ON THE FUTURE OF THE TINPLATE CONTAINER.*
Dr. W. E. Hoare.
Tin and Its Uses, Summer 1956, No. 36, p. 1–4.

177. TITANIUM

a. *PLATING ON TITANIUM.*
H. Richaud.
Electroplating and Metal Finishing, *9*, No. 9, September 1956, p. 303.

178. TUMBLING

a. *IT'S CHEAPER BY TUMBLING.*
Leon E. Laux.
American Machinist, *100*, July 16, 1956, p. 124–128.

b. The following are metallurgical abstracts taken from The Journal of the Institute of Metals, July 1956:

1. *ALUMINUM ALLOYS FOR ANODIC TREATMENT.*
Jean Hérenguel.
(Rev. Aluminum, 1955, (225), 903–906).

H. divides anodic coatings into four classes, according to the quality of the finish required: (1) protection against corrosion where appearance is of secondary importance; (2) industrial finishes on large structures where small blemishes are not noticeable; (3) decorative finishes on smaller articles which must be free of noticeable blemishes; and (4) reflective finishes, as on costume jewelry, requiring a thin, transparent film of great brilliance. He deals with each class in turn, showing the most suitable alloy for various forms—castings, extrusions and sheet—and precautions to be taken in their fabrication to avoid defects which may show up in the anodizing bath. Only high-purity metal should be used in making up alloys, and he favors those with 1–3 percent Mg, but for reflective purposes super-pure metal should be used. The article is illustrated with micrographs showing typical defects and their cause.

2. *THE MECHANISM OF LEVELING IN CYANIDE COPPER PLATING BY THE WESTINGHOUSE PERIODIC REVERSE (CURRENT) PROCESS.*
H. M. Heiling.
(Metall, 1955, 9, (17/18), 764–767.)

Following are the addresses of the publications named in the Article Reference above.

Requests for articles should be made directly to the publication.

American Machinist
330 West 42nd St.
New York 36, N. Y.

American Society for Testing Materials
1916 Race St.
Philadelphia 3, Pa.

Battelle Memorial Inst.
505 King Ave.
Columbus 1, Ohio

Corrosion
1061 M & M Building
1 Main St.
Houston 2, Texas

Electroplating and Metal Finishing
85 Udney Park Rd.
Teddington, Middlesex
England

Journal of the Institute of Metals
4 Grosvenor Gardens
London SW 1, England

Metal Finishing
381 Broadway
Westwood, N. J.

Metall
Metall-Verlag GmbH
Hubertusallee 18
Berlin-Grunewald
Germany

Metalloberfläche
Carl Hanser Zeitschriftenverlag GmbH
Leonhard-Eck-Strasse 7
Munich 27, Germany

Materials & Methods
430 Park Ave.
New York 22, N. Y.

Nucleonics
330 West 42nd St.
New York 36, N. Y.

Rheinhold Publishing Corp.
430 Park Avenue
New York 22, N. Y.

Sheet Metal Industries
17–19 John Adams St.
Adelphi, London WC 2
England

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Og Den Polytekniske Forening
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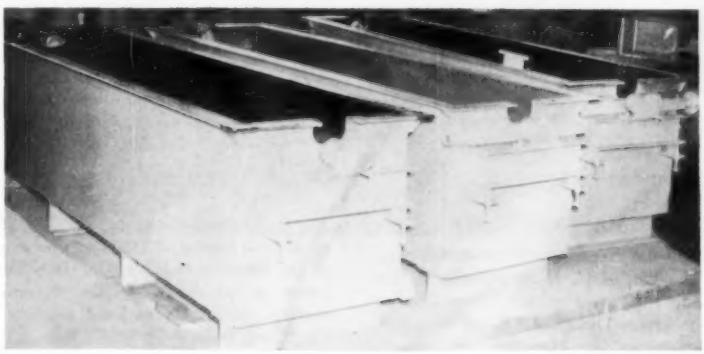

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INTERSOCIETY NEWS

NATIONAL ASSOCIATION OF METAL FINISHERS

Nickel Discussed at St. Louis

Addressing two dozen shop owners at the Hotel York, St. Louis, at an evening meeting on September 28, P. Peter Kovatis, executive secretary of the National Association of Metal Finishers, said that in the very near future, platers will be able to obtain enough nickel to meet their demands but "not all the nickel they want." He pointed out that hearings and meetings are still being held by NAMF and congressional committees to determine reasons and causes of the "nickel shortage" in some areas of the metal finishing industry.

"The small business man in the plating industry will get even smaller," warned Kovatis, "unless there is more concerted action by more members of industry to gain the recognition they are deserving as 'an important and vital segment of U. S.'s industrial economy'."

Sponsored by the St. Louis Platers' Association, NAMF, the first fall meeting was arranged by national NAMF director Henry J. Siegel, Siegel-Robert Plating Company and local president, Edward J. Musick, Musick Plating, Inc.

Principals in Sept. 28 meeting of the St. Louis Platers' Association, NAMF, at the Hotel York: l to r, Henry L. Gros, vice president; Edward J. Musick, president; NAMF executive secretary Peter Kovatis; NAMF director Henry J. Siegel; and Harvey W. Lubker, secretary-treasurer.

ELECTROCHEMICAL SOCIETY

Meyer Presides at Symposium

Dr. Walter R. Meyer, president, Enthone, Inc., presided at the Joint Electrodeposition—Theoretical Electrochemistry Symposium on Structure of Metallic Electrodeposits for the Cleveland Annual Meeting of the Electrochemical Society on Monday, October 1, 1956. The meeting was held at the Hotel Statler, Cleveland, Ohio.

Dr. Meyer has also been re-appointed as an American Electroplaters' Society representative to the International Conference for Electrodeposition to be held jointly with the Institute of Metal Finishing of England in Detroit in 1959.

Burns Awarded Acheson Medal

Dr. R. M. Burns, senior scientific advisor to Stanford University Research Institute, Palo Alto, California has been awarded the Acheson Medal of The Electrochemical Society for 1956. The medal and a prize of $1000 was presented to Dr. Burns on October 2 by Hans Thurnauer, president of The Electrochemical Society, during its national meeting at Cleveland, Ohio.

The Acheson Medal, awarded every two years for notable contributions to the advancement of the objectives, purposes and activities of The Electrochemical Society, was given this year in recognition of Dr. Burns' outstanding work on the corrosion of metals and his long-time participation and leadership in the affairs of the Society.

Dr. Edward Goodrich Acheson, founder of Acheson Colloids Company, discovered silicon carbide and was the first man to make pure electric-furnace graphite. Dr. Acheson also developed the process for reducing graphite particles to microscopic size and suspending them in liquid carriers to form colloidal dispersions.

NORTH CENTRAL REGIONAL NACE CONVENTION IN NOVEMBER

The Detroit Section of the National Association of Corrosion Engineers will hold a regional convention at the Hotel Statler in Detroit on November 15 and 16, 1956.

Four Technical Sessions and four plant trips are planned.

Technical Session No. 1—9:00 A. M. to 12 Noon.
Construction Industry Symposium—Mrs. Renee Koeff, Chairman

1. "Cathodic Protection of Structures"—J. F. Hirshfield, The Hinchman Corporation
2. "Surface Treatments for Metals in the Construction Industry"—Joseph Bigos, Steel Structures Painting Council
3. "Corrosion Resistance of Aluminum in the Construction Industry"—H. P. Godard, Aluminum Laboratories Ltd.
4. "Corrosion of Prestressed Concrete Structures"—W. O. Eberling, American Steel & Wire Company

Technical Session No. 2 (concurrent with No. 1—9:00 A.M. to 12 noon
Utilities Industry Symposium—N. A. Kerstein, Chairman

1. "Corrosion in Power Distribution Systems Above Ground"—(Speaker to be Announced)
2. "Corrosion in Power Distribution Systems Below Ground"—J. D. Piper, Detroit Edison Company
3. "Corrosion on the Fireside of Super-Heater Tubes"—I. A. Rohing, Detroit Edison Company
4. "Corrosion in Power Generating Equipment—Effect of Water Treatment"—(Speaker to be Announced)

Technical Session No. 3—2:00 P.M. to 5:00 P.M.
Chemical Industries Symposium—J. H. Munger, Chairman

1. "Elastromeric Lining Materials for Corrosion Prevention"—L. A. Woerner, Automotive Rubber Company
2. "Plastic Applications in the Chemical Industry"—R. B. Seymour, Corrosion Resistant Products, Inc.
3. "Inhibitor of Mineral Acids on Mild and Stainless Steels"—J. P. Engle & R. B. Rosene, Dowell Inc.
4. "The Corrosion Resisting Properties of The New Cr-Ni-Mn Austenitic"—G. L. Snair, Jr., Allegheny Ludlum Steel Corp.

Plant Trip No. 1—12:30 P.M. Departure
Chrysler Corporation assembly line for Windsors, Imperials, etc. (1957 models)

Fellowship Hour & Banquet—6:00 P.M. & 7:00 P.M. English Room—Speaker, W. H. Stewart, Vice President, National Association of Corrosion Engineers—"NACE—Its Aims and Value to Its Members."

Friday, November 16th—Registration—8:00 A.M. to Noon

Regional Business Meeting—9:00 A.M.—W. J. Reis, Chairman, North Central Region

Report on Technical Committees—C. P. Larabee, U. S. Steel Corp.

Educational Lecture—"A Practical Approach to Corrosion Fundamentals"—F. H. Beck, Ohio State University

Technical Session No. 4—1:30 P.M. to 4:30 P.M.
Automotive Industry Symposium—L. C. Rowe, Chairman

1. "Accelerated Corrosion Tests for Plated Coatings"—W. L. Pinner, Res. & Eng. Div., Houdaille Industries
2. "The Role of Finishing in the Prevention of Automotive Body Corrosion"—E. L. Leithauser, Research Staff, General Motors Corporation
3. "Resistance to Corrosion of Aluminum Alloys for Automotive Applications—E. T. Englehart, W. C. Cochran & E. P. White, Alcoa Research Labs.
4. "Laboratory Test Techniques for Exhaust Valve Steel Corrosion"—M. J. Tauschek & J. C. Sawyer, Thompson Products Valve Division

Plant Trip No. 2—1:00 P.M. Departure
Wyandotte Chemicals Corporation—Plant and Research Laboratories (including Corrosion Lab.

Plant Trip No. 3—6:30 P.M. Departure
International Salt Mine Co.—Trip 1400 feet below ground to the face of the mine

Plant Trip No. 4—6:30 P.M. Departure (concurrent with Trip No. 3)
Hiram Walker Distillery, Walkerville, Ontario, Canada

Photo courtesy Mitchell-Bate Co., Waterbury, Conn.

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AES NEWS

APPOINTMENTS

Dr. Samuel Heiman, AES president, recently made the following appointments:

To the National Association of Corrosion Engineers—

George E. Best, Delegate
Manager, Technical Service
Mutual Chemical Division
Allied Chemical & Dye Corporation
Block & Wills Streets
Baltimore 31, Maryland

Carl O. Durbin, Alternate
Chrysler Corporation
Engineering Division
P. O. Box 1118
Detroit 31, Michigan

AES liaison representative with ASTM Committee B-7, Subcommittee VI on the Anodic Oxidation of Aluminum and Magnesium Alloys—

Fred Keller
American Society for Testing Materials
1916 Race Street
Philadelphia 3, Pennsylvania

The AES Executive Board, at its September 1956 meeting, appointed Howard J. McAleer, president, Formax Manufacturing Corporation of Detroit, Mich., as Exposition Chairman of the Society's Industrial Finishing Exposition that will be held in Detroit in 1959 concurrently with AES's 46th Annual Convention.

A progress report was heard by the AES Editorial Board at its September 1956 meeting concerning the Educational Sessions of the Society's coming 44th Annual Convention to be held in Montreal, Canada, June 16–20, 1957. Dr. J. Kane, Educational Co-Chairman, reported in the absence of Philip M. Coady, Chairman.

Unlike the Washington Convention, the Montreal meeting will feature five single sessions with some twenty-five papers contemplated, many of which have already been scheduled. At this writing, the classifications of the five proposed sessions include "Mechanical Finishing"; "Chrome Plating"; "Research on Plating"; "Aluminum Finishing" and "Miscellaneous Subjects other than Plating and Anodizing." The need for additional papers of high standard was stressed both by Dr. Kane and by the Editorial Board.

Editorial Board members and others present at the meeting included Dr. Abner Brenner, John B. Capuano, J. Lewis Doughty, Arthur W. Logozzo, Howard J. McAleer, Fremont L. Scott, Dr. Russel E. Harr, Dr. Harold J. Wiesner, Dr. Samuel Heiman, Ralph D. Wysong, Rodney Leeds and John P. Nichols, Chairman.

At the September meeting of the Executive Board the ByLaws of the Editorial Board were approved.

As a result of Executive Board action taken at its September 1956 meeting, the British Columbia Branch became the AES's newest affiliate. The Board granted it a Temporary Charter. As thus chartered, the British Columbia Branch includes 13 original members plus two others transferred from the Toronto and Seattle Branches respectively. Temporary Chairman is J. H. Lee of Vancouver. This newest addition, if and when made permanent by the Board, would bring the Society's Branch total to 56, located in the United States and in Canada and Australia.

The Supreme Society at its June 1956 meeting named Los Angeles as locale of the

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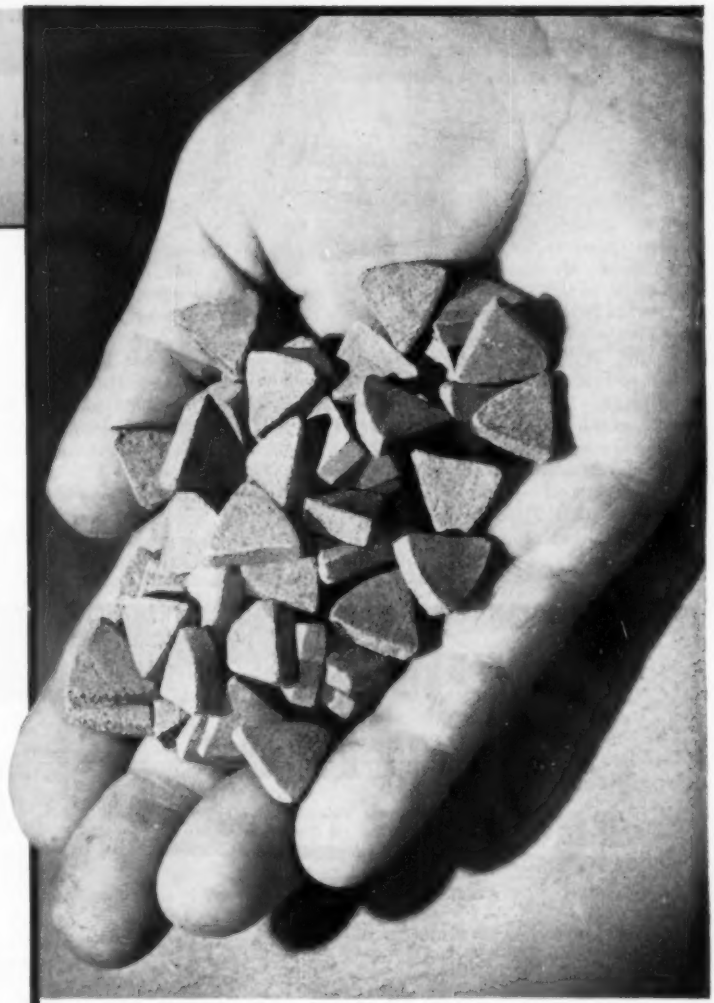

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AES NEWS

Society's 47th Annual Convention. The Los Angeles Branch, Convention host, now has appointed Tony Stabile as Convention Chairman with George J. Hetz as Co-Chairman. The Branch's proposal that the Annual Convention be held during the second week in July, 1960 was favorably considered by the Executive Board, and the dates now set are July 10–14, 1960. The Statler Hotel, Los Angeles, has been designated as the Convention site.

By action of the Executive Board at its September 1956 meeting, Dr. Samuel Heiman, president, was authorized to call an Interim Meeting of the Supreme Society, to be held on Saturday, January 12, 1957 in Pittsburgh, Pennsylvania with the Pittsburgh Branch as host. The Executive Board will meet in regular session on Friday, January 11 and Sunday, January 13. The Branch has altered its regular monthly meeting date to Friday evening, January 11, so as to enable Delegates and Executive Board members to attend. For hotel reservations Delegates should write to R. J. Goldbach, 531 Overbrook Boulevard, Pittsburgh, Pennsylvania.

Leeds

Panico

Bringing a solid magazine and newspaper record spanning over twenty years, **Rodney Leeds** has been appointed editor of PLATING effective this issue.

For some six years before joining PLATING, Leeds was managing editor of the ABC-rated magazine, American Brewer, well-known both for the quality of its technical and scientific coverage and for the presentation of industry news and features.

Before that, Leeds, for six years, was advertising manager, then business manager, finally managing editor of Marine News, a prominent shipping industry magazine with a life-span to-date of nearly a half-century.

He was a newspaperman of established reputation prior to concentrating upon magazine publishing. With his family, he resides in Little Falls, N. J.

Married: Miss Ann Panico, Editorial Assistant of PLATING, recently became the bride of Robert A. Freda. Following a brief honeymoon in the Bahamas, Mrs. Freda has returned to her PLATING desk. PLATING extends its hearty best wishes to the newlyweds for a long and happy wedded life.

An impressive program is being formed for your Society's 44th Annual Convention by the Convention Committee, headed by G. Ross Davidson. The time has arrived for members to make plans to attend the Convention in Montreal, June 16 to 20.

Montreal, that 30-mile-long island city in the St. Lawrence river, is an ideal convention spot, with its many famous attractions: the Lookout atop Mount Royal, a caleche ride, the St. Joseph Oratory, Notre Dame de Bonsecours, the Chateau de Remezay, the Old Fort, St. Helen's Island, the Wax Museum, the Botanical Gardens, Notre Dame Church, St. James Cathedral, the Indian Reservation at Caughnawagha, the Laurentian mountains and many other points of cultural interest.

The Convention Headquarters will be at the 1100-room Sheraton-Mount Royal.

Look for more next month about Montreal, Your Host City, and Montreal Branch, Your Host Branch.

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PERMA BLACK—process for blacking stainless steels, cast iron, malleable iron and other steels; temperature range 245–250° F.

LUSTRE BLACK—process blacking bath for ferrous steels at 280–300° F., single tank operation.

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ESTOX 12 HEAVY DUTY FERROUS SOAK CLEANER—for cleaning before electroplating. Excellent oil and dirt removal. Long life.

ESTOX 8 MAGNESIUM SOAK CLEANER—a carefully compounded formulation for soak cleaning magnesium and spray stripping paint.

ESTOX 28 BARREL FINISHING COMPOUND—for barrel burnishing brass, copper, nickel, silver, gold. Maximum lubrication and free rinsing eliminate spotting from hard water —give uniform results.

ESTOX 110 WASHING MACHINE CLEANER—a superior cleaner for all industrial washing machines.

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ESTOX 130 PAINT DEFLOCCULATOR—to keep headers and nozzles in paint booths open for maximum atomization. Water soluble.

ESTOX 150 GLASS CLEANER—A combination of alkaline salts and wetting agents with additives to remove tarnish from sheet or plate glass.

ESTOX 163 PHOSPHATE COATING—to clean and coat iron phosphate on ferrous materials. Fine grained for ideal paint base.

ESTOX 170 DEOXIDIZER AND BRIGHTENER—designed to deoxidize aluminum or brighten copper and brass. Easily handled in dry form. Non-hazardous.

ESTOX 193 RUST PREVENTATIVE—a new product to prevent rusting of ferrous materials. Extremely economical to use.

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AES Membership Report

ELECTIONS

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Buffalo: R. R. Bair, A. Bryant, P. J. Conn, L. E. Ellman, L. E. Stark
Cincinnati: D. L. Shrout
Detroit: J. R. Daly, G. R. Edgington, W. R. Essery, W. R. Hautamaki, R. J. Lang, F. M. Oliver, A. Tulumello, C. R. Wiese
Hartford: J. C. Rovaldi
Lancaster: C. H. Raab
Los Angeles: A. A. Carroll, N. W. Green, V. F. Ott, E. L. Riggs, J. S. Smatko, R. Webb
Melbourne: E. J. Bostwood
Milwaukee: C. L. Jackson, F. A. Stiodle
Montreal: H. Duffill, U. Lupien, R. Senecal, E. Wallace
Newark: M. Bolemboch, W. R. Fidelius, J. Loudon, A. Wasserman
Philadelphia: R. E. Griggs, J. R. Hilderbrand, M. A. Manning, Jr.
Rochester: L. J. Lipinski, Sr., D. Messinger
St. Louis: L. J. Evens, R. W. Gotsch, T. S. Poniewaz, L. V. Schowalter
San Francisco: G. O. Buschell, F. M. Condrott, T. N. Daly, F. F. Guzman, T. G. Harry, P. Reighard, N. J. Smith
Southeastern: F. E. Fletcher
Toronto: J. F. Goudey, D. F. West, O. D. Wing
Waterbury: R. Feigin, J. R. Kennedy
Member-at-Large: V. Baruzzi, Sao Paulo, Brazil; F. Van de Horst, Basel, Switzerland

REINSTATEMENTS

Columbus: H. L. Moore
Syracuse: J. H. Johnson

TRANSFERS

Bridgeport: D. Fineberg, to Member-at-Large
Detroit: R. J. Racine, to Los Angeles
Newark: E. Costallano, to New Haven
Pittsburgh: E. B. Washburn, to Waterbury; W. D. Wilson, to Cincinnati
St. Louis: W. L. Aves, to Dallas-Ft. Worth
San Antonio: R. Rogers, to San Francisco
Waterbury: L. N. Davies, to Grand Rapids; H. C. Haines, to New York

RESIGNATIONS

Bridgeport: C. Brown, E. Doell, S. Suhanovsky
Capitol District: A. L. Jenny, J. G. Stevens
Detroit: J. T. Ford, J. A. Hoeffel, R. Jankowski
Lancaster: A. M. Roberts
Saginaw Valley: C. J. Auger, D. H. Fairchilds, J. A. Hudson, J. A. Matsko, F. A. Powada, F. J. Shannon, R. Sprague, Jr.
St. Louis: G. Fuerst, L. Schneider
Springfield: P. W. Fogg

SUSPENSIONS

Buffalo: W. Fullerton, W. McDonald, W. Rosdahl, R. W. Spencer
Capitol District: D. J. Barone, W. J. Becher, F. M. Brodie, Jr., F. Bucci, N. J. Gibberti, L. T. Crenan, J. G. Danadio, V. P. Greco, W. F. Hanford, D. Kollath, F. Leone, H. F. Millis, W. O. Naylon, R. Robelotto, N. A. Searles, E. P. Wylde
Cleveland: J. Baker, W. E. Dame, J. Emlich, K. Eubanks, W. Foisel, C. A. Fullerton, R. Gates, D. Guion, H. E. Hafele, D. Hutchinson, O. R. Jackson, W. P. Karash, J. Keers, A. P. Keller, J. T. Kilbane, J. Kopp, W. Kruper, K. McCrea, H. W. McElhaney, C. Meldrum, W. Montali, M. B. Orndorff, D. M. Overcash, J. Palik, Jr., R. Parks, K. Prentice, F. Rometti, J. Sheridan, G. Shope, H. Sliney, G. Stevenson, J. Tierny, P. Vicari, N. Zinni
Milwaukee: A. W. Hansen, J. Pemper, E. Wilburth
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Pittsburgh: J. N. Abrams, S. Barnartt, E. M. Barnes, C. W. Churchill, J. W. Condon, W. E. Dickman
St. Louis: P. W. Babby, R. H. Bobilin, H. R. Hanley, J. P. Hendrickson, S. Johns
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Syracuse: C. L. Astifan, H. C. Barth, J. Casella, R. Downs, R. W. Hergonson, C. Hopkins, E. Huck, F. Jenks, S. Kozien, H. H. Langenmayr, M. T. Lawlor, F. McNish, A. Messano, M. A. Michaels, R. Moore, F. H. Mulholland, J. J. Otis, M. Pancoast, E. P. Swartz, C. A. Valentine, W. M. Williams
Wichita: T. H. Bamford, C. C. Bolin, N. Bye, F. M. Flanders, J. L. Lockwood, F. D. Manners, R. O. Stroud, N. Winn

DEATHS

Bridgeport: W. Ehrencrona
Cleveland: A. W. Korb
Detroit: F. W. Wagner
Lancaster: J. W. Miller
Milwaukee: F. J. Marx
Providence-Attleboro: A. Claflin, E. C. Garabedian
Member-at-Large: R. Sinclair, Leicester, England

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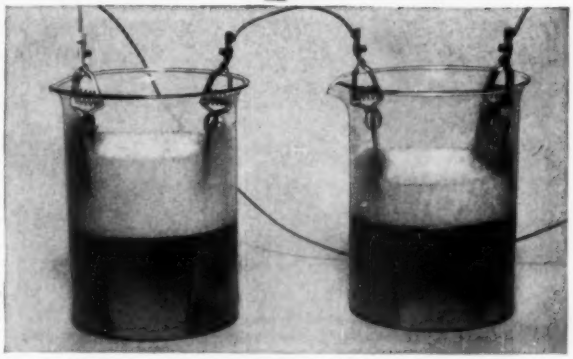

DIFFERENCES IN FOAM BUILD-UP *developed by two different electrocleaners are shown above. Beaker at left contains a conventional electrocleaner in general use: beaker at right contains Diversey No. 12 electrocleaner. A current of 125 amps per sq. ft. on work is sent simultaneously through each beaker. Ordinary electrocleaner (left) produces a thick, heavy foam blanket which, in your cleaning tanks, would trap an explosive mixture of hydrogen and oxygen gases. In Diversey No. 12 electrocleaner (right) foam blanket is properly controlled . . . this is your guard against explosion dangers* and *solution spray.*

How to control foaming and

GUARD AGAINST EXPLOSION DANGERS

in electrocleaning

Excessive foam build-up in the electrocleaner tank always creates a danger of explosion caused by build-up of trapped hydrogen and oxygen gases. In barrel plating, this excessive foam build-up is increased by the agitation of the solution as barrels are rotated.

Even under extreme agitation conditions, Diversey No. 12 electrocleaner not only minimizes the explosion hazard but produces superior cleaning as well. Due to its high current-carrying capacity, this improved electrocleaner is exceptionally fast-acting on all types of contamination. And its high contamination capacity means longer periods between dumpings.

FREE-RINSING, NON-CAUSTIC SOAK CLEANER

In barrel cleaning, excessive solution is carried over from soak tanks to electrocleaning tanks. The result is two costly problems: (1) excessive carry-out means higher soak cleaner consumption; (2) carry-over of soil-laden solutions shortens electrocleaner life. Diversey No. 404 soak cleaner was specifically developed with extraordinary wetting action and water softening properties. Since these two factors combine to give faster rinsing and draining, No. 404 assures you a more efficient use of both soak and electrocleaning solutions. Soak cleaning solutions drain back into soak tank or are rinsed free. Upkeep costs are reduced, solution life is increased, carry-out is minimized.

Better wetting action also means better cleaning. Since immersion time in soak cleaner is limited, No. 404's fast-wetting (soil penetration) leaves more time in the cycle for actual cleaning. This is another reason why No. 404 removes the toughest contamination.

For free illustrated brochures on Diversey metal cleaners, write Metal Industries Department, The Diversey Corporation, 1820 Roscoe St., Chicago 13, Illinois.

Arthur Pierdon receives engraved album, l to r, Elizabeth, Mary (Mrs. Arthur), Arthur and Henry Pierdon, Ken Huston and Margaret Pierdon. Ellen and Florence Pierdon left meeting before picture was taken at the Statler Hotel, Washington, D. C.

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Tygon is the perfect membrane for oversheathing with USSCO acid brick. Built-in-place tanks, tank piers and foundations are lined at your plant to your specifications by trained field applicators. And our engineering service stands ready to help with all your lining problems.

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BALTIMORE-WASHINGTON

Convention Committee Holds Final Meeting

The Baltimore-Washington Branch held its final Convention Committee meeting at the Statler Hotel in Washington.

After an excellent dinner, Chairman **Pierdon** expressed his appreciation for the unselfish efforts given by the committee chairmen and their members. All realized the convention was planned to give the guests the most for their money and the efforts of each was directed towards this aim. The administrative expenses were the lowest for any of the recent conventions.

Jules Horelich, chairman of the Finance Committee, reported that a small profit was realized, where a deficit had been expected.

Ken Huston, co-chairman, called for a final report and interesting incidents from each of the committee chairmen. He presented the chairman with an engraved album containing about 50 Kodachrome pictures of convention activities. It also contained black and white photographs supplied by PLATING, Products Finishing and Metal Finishing. A hand lettered frontispiece was signed by each committee member.

K. M. Huston
Co-Chairman,
Convention Committee

BRIDGEPORT

Ivins Speaks on Rectifiers

The regularly scheduled meeting of the Bridgeport Branch was held at the Hotel Barnum on Friday, September 14.

President **Bonazzo** presided. Thirty-six members and guests were present.

A minute of silent prayer in standing tribute to the recently departed **William Ehrencrona** was observed. The secretary was asked to send Mrs. Ehrencrona a letter expressing our feelings as a group.

Crosby U. Rogers was accepted as a member.

President Bonazzo will appoint a committee to represent the branch's responsibility in the forthcoming regional.

Al Ferguson, chairman of the Christmas Dinner-Dance, appointed the following to the committee for finalizing details: **R. Parker, R. Coral, R. Creamer, A. Jocis, G. Eckholm, W. Lindsay, W. Hyatt, G. Haas, F. Tatum.**

Local recognition of the aims of the society was a topic of discussion; the branch has suffered because of lack of publicity whenever it held an affair or inducted new members into the branch; also the lack of our personally being ambassadors of good will on behalf of the society was discussed. As a result of this many members ordered society pins which would be distributed at the next meeting

and all members were urged to display them prominently.

Once again the door prize was won by lucky **Harry Simon.**

A. Ferguson, librarian, introduced the featured speaker of the evening, **C. F. Ivins Jr.,** assistant manager of electrical sales of Hanson-Van Winkle-Munning. His discussion of the advantages of Germanium rectifiers over that formerly used was well received. A short question and answer period followed.

R. G. Parker
Secretary-Treasurer

CHICAGO

Session Covers Bright Copper Solutions

The first meeting of the fall and winter season was held at the Western Society of Engineers on Friday, September 14. After an interesting business meeting and dinner, a most informative educational session on the operation of bright copper solutions was conducted.

Because the subject is of such widespread interest the Chicago Electroplaters' Institute members were guests of the Chicago Chapter.

The speaker of the evening was **E. H. McCoy** of Electrochemical Products Co., Milwaukee, Wis. "Mac" McCoy is well known to many of the Chicago Branch members, having been a very active member in the branch before moving to Wisconsin.

In the early part of the discussion McCoy invited the group to interrupt him at any time with questions. As a result the session covering the operation of acid, phosphate and cyanide copper plating solutions was held on a classroom basis, with many questions asked and answered. McCoy is to be congratulated for the fine way in which the subject was presented and discussed.

Joseph Corre
Publicity Chairman

CINCINNATI

Drive Urged for New Members

The meeting on September 26 was called to order by President **Roof** with 49 members and 3 guests present.

Donald L. Shrout's application for membership was approved.

Ezra Blount discussed the Tri-State Meeting which was held during the National Convention at Washington and he moved that the Cincinnati Branch should approve the Tri-State Region By-laws which have been accepted by the other Tri-State Branches.

Will Loveless, chairman of the Membership Committee, urged everyone to bring in new members even though they are not assigned to his committee.

Bob Rarick moved that our By-laws be changed so that the term of our representatives to the Technical and Scientific Councils will correspond with their requirements.

Bob Rarick and **Les Helmich** were appointed to draft a change in our By-laws to fulfill the motion.

Chuck Wise reported the Convention Committee has completed arrangements for banquet rooms, etc. and that the Women's Committee has just about completed their schedule. **Bob Miller** reported the Educational Committee has compiled suggestions for topics for the technical papers and also set up the schedule for presentations. As a result of an Editorial Board decision, there will be no more than twenty-five papers presented.

A run-down on the Washington Convention was given by Bob Miller.

Mr. Methany of the General American Transportation Company gave a talk on the "Kanigen Process." He began with an historical discussion of electroless nickel plating, research, development and production developments of the "Kanigen Process." Practical applications were discussed followed by an interesting and informative question and answer period.

The social hour was sponsored by William Young & Company, Inc.

David L. Kaplan
Secretary

DAYTON

Combs Speaks on Chrome Plating

The Dayton Branch held its first meeting of the new season, September 19, at the Hotel Biltmore. A very gratifying 41 members and friends turned out. Chairman **Bob Ruleff** opened the meeting by having past treasurer **Jack Baker** read a

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BRANCH NEWS

report on the financial status of the Branch. It is in very good shape. A report on the recent convention showed the Dayton Branch was very well represented. A report on the committee meeting of the Tri-State Regional stated that all members have or are now willing to accept the By-laws.

Librarian **Byron Bowman** introduced the speaker for the evening as a former member of the Dayton Branch and one of those instrumental in forming the Columbus Branch, **Eugene L. Combs,** supervisor, chromic acid sales, Diamond Alkali Co., Cleveland, Ohio. Combs presented a paper, "Chrome Plating—Up-to-Date."

After covering the history of chrome plating, the new additive CPA 1800 was discussed as to its merits and shortcomings. Samples of articles plated using the additive were on hand for inspection.

Refreshments after the meeting were through the courtesy of the Globe Chemical Co., Dayton and their local representative, **Karl Jund.**

R. M. Clinchens
Secretary

DETROIT
Steel Discussed by Swift

The first fall meeting was held in the Sheraton Cadillac Hotel on September 7 with **Howard McAleer** presiding.

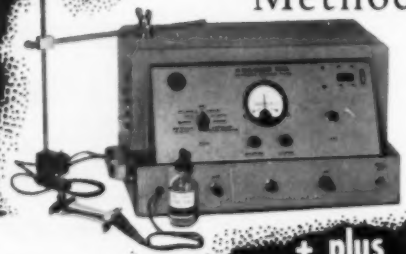
Approximately 115 members and guests were present in our new meeting place.

President McAleer introduced **Glen Freidt,** who read the following resolution:

WHEREAS **Frederick W. Wagner,** a distinguished, esteemed and beloved member of the American Electroplaters' Society for many years was claimed by

Check plating thickness
WITH THE
KOCOUR ELECTRONIC THICKNESS TESTER*

*Anodic Solution Method



6 Simple steps . . . to quick, accurate results

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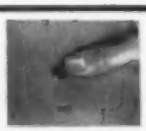
1.
MOUNT THE CELL . . . on the spot to be tested and clip lead wire to specimen.

2.
ADD TEST SOLUTION . . . which corresponds to the type of plating and base metal tested.

3.
PLACE STIRRER IN POSITION.

4.
SET SELECTOR SWITCH to the type of plating to be tested as indicated on panel.

5. 
PRESS THE TEST BUTTON to start the test . . . and upon completion the unit shuts off automatically.

6.
TAKE THE READING directly from the counter on panel i.e., 0.0004".

TOTAL TIME . . . less than 2 minutes

- DETERMINE THICKNESS OF
  decorative chromium
  heavy chromium
  silver, copper
  tin, brass
  cadmium, nickel
  zinc, lead
  lead-tin alloy
  tin zinc alloy
  on various base metals and materials.
- WIDE THICKNESS RANGE
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- ELIMINATES HUMAN ELEMENT

Don't delay! See how the Electronic Thickness Tester can solve your problem. Write for literature today.

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LUSTER-ON 52 POWDER *is a low, low priced single dip, no-leach conversion coating for zinc plated surfaces.*

LUSTER-ON 52 POWDER was recently developed by The Chemical Corporation for automatic equipment where facilities are not available for added leaching and rinsing.

LUSTER-ON 52 POWDER gives a bright bluish hue; provides lasting corrosion protection against staining, tarnishing and white powder products.

LUSTER-ON 52 POWDER can *now* be used in cases where cost has prohibited use of chromates in the past. For instance, electrical conduit, conduit boxes, screws and builder's hardware, tools, electronic parts, air conditioning parts, automotive parts, cheap toys.

LUSTER-ON 52 POWDER is not only low, low in price, but eliminates expensive handling, space-consuming storage and carboy deposits.

Still available, of course — time-tested Luster-On liquid dips and coatings for all your needs.

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death August 3, 1956, and

WHEREAS he served the Detroit Branch and the national Society so well in so many capacities during his lifetime, and

WHEREAS he contributed so much in the advancement of the electroplating industry, and

WHEREAS he was one of the owners of a company which made tremendous contributions to the industry and achieved an outstanding record in its field, and

WHEREAS he was a devoted friend, husband, father and a fine servant of this country and his community,

WE DO THEREFORE RESOLVE that we express our sorrow in the untimely passing of our friend and associate and our gratitude for his unselfish service to this organization, and extend our deepest sympathy to his family.

The following new members were elected, bringing the Branch's membership strength to 686: **John R. Daly,** The Udylite Corporation; **George R. Edgington,** Pontiac Motor; **William E. Essery,** Midwest Abrasive; **William R. Hautamaki,** Basic Service Corporation; **Ronald J. Lang,** Wyandotte Chemical; **Frederic M. Oliver,** Oakite; **Angelo Tulumello,** Metal & Thermit; **Chas. R. Wiese,** Research Staff, G.M.C.

Speaker for the evening, **John A. Swift,** president of Swift Industrial Chemical Company, Boston, Mass., presented to the Detroit branch an interesting discussion on steel making methods, manufacturing operations and types of steel to better acquaint the metal finisher with the metal he is plating. He brought out some of the finishing problems that may arise from the improper selection and processing of the steel prior to plating. A number of slides were also shown. A lively question and answer period followed which evidenced the interesting talk.

Fellowship continued after the meeting with the serving of beer and pretzels.

Patrick J. Driscoll

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for **fast racking and unloading small parts**

Handles variety of work. Reduces handling, eliminating wires, springs, etc. *Economical—time saving.* Replaceable units can be assembled in any spacing arrangement desirable. Made in *aluminum* and *titanium.* Write for circular.

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Here's the Polarizer ***YOU*** *asked us for!*

Low cost — completely portable, yet it does everything you need!

Two years ago we brought out polarizers for electro-platers to use in making rapid, accurate analyses of their plating solutions. As we told you at the time . . .

The C-1 Gave You FULLY ADVANCED Research-Control

. . . because we developed it out of our own long experience as contract and production platers, and because test models had been very well received by large plating concerns.

But You Told Us It Gave You Far MORE Than You Needed

When we talked to you—the plating men on the firing line—you told us you didn't need expensive additional research features. You needed a small, self-contained instrument to tell you the exact metallic content of your plating solutions.

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In two steps you get the answer: take the current reading on the microammeter; read the analysis on the scale in the Patwin "Cook-Book" Manual. It takes only a couple of minutes; there are no complications.

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This new Patwin C-2 Polarizer doesn't have to be plugged in! It runs on three 1½-volt Burgess batteries. Its range is: 0-10-20-30-50-100 microamperes full scale. The sensitivity on direct reading is .1 microampere. Case is 14" x 8" x 8", and is finished in gray hammertone finish on steel—bonderized and primed. For full details, send in the coupon today!

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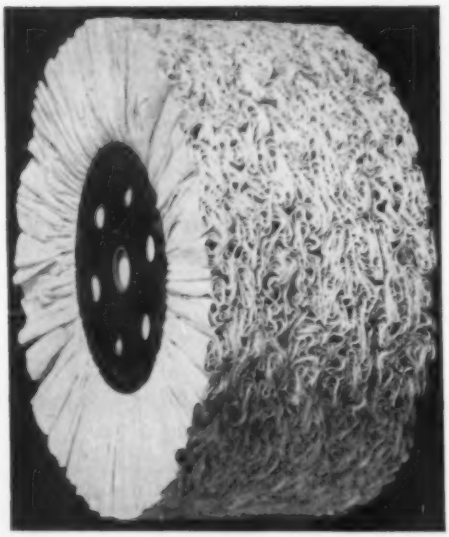
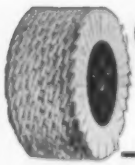


This new Churchill Finger-Buff* No. 300H15 is a new type of Finger-Buff* . . . unique in that the face of the buff is deliberately made *non-uniform*. This eliminates all tendency to streak or gouge the work.

Manufacturers report that results with this new No. 300H15 are better finish with higher color on stainless, copper, and zinc die castings.

The Churchill Finger-Buff* No. 300H15 is made only with the best grade, heaviest weight, all new 86/93 bias-cut cotton cloth.

● *Churchill Finger-Buffs* are competitively priced. Produced in all sizes from 6" to 18" diameters. For complete information write your problem.*



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TO PLUG HOLE SIZE	1/8-3/16	3/16-1/4	1/4-5/16	5/16-1/2	1/2-5/8	9/16-11/16	5/8-3/4
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BRANCH NEWS

MILWAUKEE
Annual Meeting Educational Program Completed

Eighty-six members and guests were present when President **Herman Tessman** called the September 7 meeting to order. The meeting was held at the Racine Country Club.

Christopher L. Jackson and **Frank A. Stindle** were accepted unanimously to membership.

The educational chairman, **Leslie Diveley,** announced that **Gene Piellusch** and **Frank Marshall** were appointed assistant librarians. Diveley divulged the program which had been formulated for the educational portion of the branch meetings during the 1956–57 year. It was announced that all arrangements have been made for the educational sessions of the Annual Meeting which will be held on Saturday, April 27, 1957.

Cliff Peter made inquiries relative to the National Convention. In response, delegate **Phil Ritzenthaler** gave a verbal report on items of interest and importance that had been undertaken and acted upon at the National Convention.

Art Linn expressed favorable comments regarding the Milwaukee Branch and urged continued efforts to always keep it thriving and active.

The president commended the following members for an excellent job in planning and executing the Racine Meeting: **Paul Beardsley,** chairman; **Sam Audenby, Ray Goodsell, Gene Rinehart, Rod Olsen** and **Ken Olsen.**

A budget committee, consisting of **Hank Bornitzke,** chairman; Frank Marshall and **Sy Taterzynski,** was appointed by the president.

Paul Beardsley, chairman of the Racine Meeting Committee, welcomed the membership and guests to Racine. Prizes, entertainment and a buffet luncheon brought the meeting to a successful close.

S. Taterzynski
Secretary-Treasurer

MISSISSIPPI VALLEY
Corrosion Picture Shown

The Mississippi Valley Branch met September 19 at the Tower Restaurant. **Joe McConnaughy** and **Bernard Nordblom** were in charge.

The meeting was preceded by a dinner. After the reading of the minutes with Bernard Nordblom in charge, a movie was shown entitled "Corrosion in Action." It was sponsored by International Nickel.

Paul G. Chamberlain
Secretary-Treasurer

MONTREAL
Committees Report on Convention Details

President **P. M. Coady** presided at the September 10 meeting at which 23 members were present.

The minutes of the previous meeting were adopted on a motion by **J. T. Reisenburg Jr.,** seconded by **J. Serbeniuk.**

Convention Chairman **G. R. Davidson** read a detailed report of progress to date by various convention committees. He also outlined the planned procedure for handling future details. He was praised for his work at the Washington Convention by President Coady.

A check was presented to the branch by the membership chairman, **J. T. Reisenburg Sr.** It had been won for the branch by his committee for the increase in membership during the preceding year.

Applications for membership in the society from **H. Duffill, Roger Senecal, Edward Wallace** and **Ulderic Lupien** were accepted.

During the discussion of plans for the Annual Dinner Dance, it was decided that a later date be secured than the original October 12 reservation. **N. Cronin** was appointed to head the Dance Committee.

W. T. Scott
Secretary-Treasurer

NEWARK
Two Speakers and Movie Make Full Meeting

The September 21 meeting of the Newark Branch was called to order by President **Clifford Struyk,** following a movie presentation by **Howard Cobb,** with 95 members in attendance. Secretary **Foulke** announced that the Branch now has 301 members and presented three applications for action. **William Grigat,** chairman of the Christmas Party Committee, reported

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THE ELECTRIC MATERIALS CO.
NORTH EAST, PENNSYLVANIA

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that real progress was being made, and as chairman of the Membership Committee noted that every member was a member of this committee and announced that **Seymour Longai** would serve as co-chairman.

Librarian **Dodd Carr** introduced **Cy LaManna** of Bart Laboratories, Inc., to present the timely topic "The Chemists' Role in Electroplating." He pointed out the need for regular analyses and record keeping, the chemists' function with respect to improving processes and developing new ones as well as the inadvisability of the chemist performing routine tests. The various methods of analysis, plating tests and physical property measurements were discussed in the light of their importance to the plating industry.

Dr. A. M. Max of the Radio Corporation of America then presented the principal paper of the evening, "The Contribution of Electroplating to High-Fidelity Records." The job of the plates is to reproduce accurately the recording and this is being done now much as at the start of the industry. The improvements have been primarily the result of much more control of the plating process. Impurities are controlled by continuous purification so that copper is below 5 ppm and iron below 10 ppm.

Stress is also carefully controlled. One of the important results of the improved control has been the elimination of the older polishing step which is undesirable for high-fidelity records. After a question-and-answer period refreshments were enjoyed.

And you can put a lot of metal work through a cleaning tank charged with

Cowles NS SOAK CLEANER

because Cowles NS Soak Cleaner has *extra soil capacity.* Cowles NS Soak Cleaner gives you *more emulsifying* action—*more power* to hold loosened soil in suspension long after ordinary soak cleaners have broken down.

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See Cowles' other advertisements on pages 1302 and 1324

The speakers for the Annual Meeting on December 14 will be **W. K. Murray,** Enthone, Inc., New Haven, Conn., on the subject: "Overcoming Problems in Electro-Plating" and **E. L. Combs,** Diamond Alkali Company, Cleveland, Ohio, on "Decorative and Hard Chromium Plating."

D. Gardner Foulke
Secretary

PHILADELPHIA

Nixon Speaks on Aluminum Anodizing

The opening gun of the 1956–57 season was fired with a loud report as an enthusiastic group of 85 was on hand at the Engineers' Club, on September 24, to hear **Cleveland F. Nixon** deliver the annual Honorary Members Memorial Lecture, "Aluminum Anodizing in the Automotive Industry." A dinner attended by 72 preceded the meeting.

At the start of the meeting President **William Trusdell,** as an innovation, had one man from each table introduce to the audience the others seated at his table. Two active members were admitted. The secretary read **John P. Nichols'** letter of September 21 on the importance of returning the ABC cards sent to members; **Francis T. Eddy's** letter of August 30 on articles for PLATING; and the names of those suspended for non-payment of dues. He urged the members help in getting those suspended to pay-up and again enjoy the benefits of AES membership.

The committee chairmen for the Annual Education Session and Banquet at The Benjamin Franklin on Saturday, October 20, made reports. An invitation to attend was sent to the members of ASTM Committee B-8, meeting in Philadelphia, October 18 and 19.

AES President **Dr. Samuel Heiman** spoke about Society affairs touching on: Proceedings, PLATING, Executive Board meeting, Process Control Handbook and broadening the base of the Society.

Robert Elliott was appointed as liaison member to Engineering Week in 1957, which honors George Washington, the engineer. This will be held in Philadelphia during the week of Washington's birthday.

C. Brooks Ricca, librarian, introduced Nixon, who announced that the paper was co-authored by **Howard Keeler.** Nixon stated that although the use of gold-color anodized aluminum started at General Motors with the license plate frame on the 1954 Cadillac, their experience with anodized aluminum goes back for 25 years on aluminum refrigerator trays and about 15 years on motor coaches and buses, where almost the entire exteriors have been sheathed in satin-anodized aluminum.

He gave the reasons that prompted the present trend to use more anodized aluminum on passenger cars, among which are: the shortage of nickel; the desire for a new look after more than 25 years of chromium, now considered a bit old fashioned; the difficulty to achieve with anything but aluminum the desired finishes on the grilles and wheels; the high corrosion resistance of anodized aluminum (it doesn't rust or erupt into blisters like nickel and chromium on steel).

Limitations of aluminum are: strength is less than steel—alloying to increase strength affects adversely the appearance and anodizability; a full lustre after anodizing is not yet obtainable, although this has been somewhat offset by the gold color.

Nixon next gave complete process information on gold anodizing at Cadillac, describing in complete detail the solutions, etc.

As an indication of the interest in and the importance attached to the paper, the importance attached to Nixon's paper, 27 questions were asked of him following the conclusion of his formal remarks. His paper warrants publication in its entirety.

I. Wm. Marcovitch
Secretary

PITTSBURGH

Four New Members Welcomed

The initial meeting of the current season was held September 5 at the Gateway Plaza. Following a fine steak dinner, the business meeting was opened by President **M. Ceresa.** Four new members were welcomed by the Branch, namely, **Richard P. Cope Jr., Joseph E. Kessler, Edward L. Kost** and **William M. Lorkovic.** The transfer into the Branch of **Rafael Diaz** from Twin Cities Branch was also announced. Two applications for membership were read for the first time from **Jacques G. Lussier** and **Edward B. Keller.**

The financial report was given by Treasurer **W. Pizoli.** A short discussion was held on the possibility of investing $500 in a savings account rather than leaving excess capital lie idle. The Executive Committee was instructed to investigate further and report at the next meeting.

The guest speaker, **Dr. W. G. Sink,** was introduced by Librarian **R. Woehrle.** Dr. Sink of Fisher Scientific Company discussed "Laboratory Instrumentation for Electroplaters." He touched on many instruments which he feels will become very useful to the plater in the control of plating solutions and waste waters.

C. McHattie won the door prize, a set of kitchen utensils, donated by **C. Benson** of Behr-Manning Company. The door prize is a special feature of each meeting and is presented by one of the suppliers of the area.

Fred Stevens
Secretary

SAGINAW VALLEY

Two Speakers on Kindred Subjects

On September 12 the first meeting of the 1956–1957 season of the Saginaw Valley Branch was held in the Colonial Room at Zehnder's Hotel in Frankenmuth, Mich.

Chicken dinners, the specialty of Frankenmuth, were served and enjoyed by 53 hungry electroplaters.

A short business meeting followed during which two new members were voted in.

The two principal speakers were **King Ruhley** of the Michigan Chrome Co. and **Duane Faulman** of the Imperial Rack Co.

Ruhley talked about the latest development in rack coatings.

Faulman discussed rack fundamentals and design and introduced the new "do it yourself" kits for assembling racks to fit parts for anodizing.

After the informative talks, slides were shown of the July Stag Day Party.

Charles Melekian
Recording Secretary

SPRINGFIELD

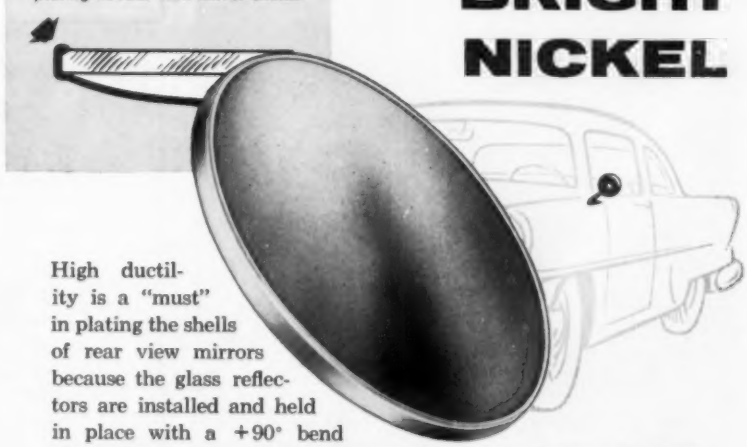
Educational Course Under Consideration

The Springfield Branch met at Blake's Restaurant to open the 1956–1957 season, on Monday, September 24. After a social period and dinner, the guests and members settled down to a technical session conducted admirably by **Raymond Mitchell** of the Mitchell-Bate Company, of Waterbury, Conn. Mitchell discussed "Plating Racks and Racking." Samples were on

for high ductility use...

SEYMOUR BRIGHT NICKEL

Here's where YANKEE METAL PRODUCTS CORPORATION relies on Seymour *high ductility* in plating its rear view mirror shells.



High ductility is a "must" in plating the shells of rear view mirrors because the glass reflectors are installed and held in place with a +90° bend *after plating.* It's one of the reasons why many producers of plated metal products rely on Seymour Bright Nickel Solutions. Seymour also assures them of greater throwing power, easy control and eliminates the need for buffing and polishing before chrome plating.

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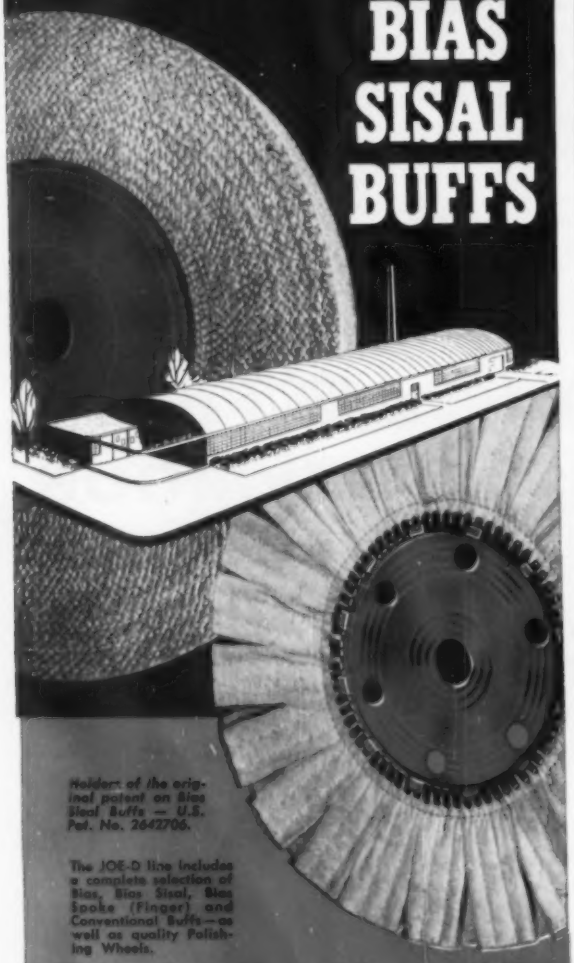

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BRANCH NEWS

display to emphasize various types and features. **Thomas Bate**, the other half of the company, was also present and assisted in the discussion period.

Announcement was made by President **Roger Heroux** that there was a possibility that the Springfield Branch would sponsor and develop an educational course in Electroplating and related subjects. All plans are in a preliminary and tentative stage at this time, but President Heroux called a special meeting to further develop the subject.

Henry L. Heissfeld
Secretary

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BUFFALO meets first Friday of each month at 6:30 P.M. at the Markeen Hotel, Main and Utica. Secretary, Fred Goeckel, 139 Overbrook, Tonawanda, N. Y.

INDIANAPOLIS meets first Wednesday of each month at 6:30 P.M. at the Fox Steak House, 1207 E. Washington St., Indianapolis, Ind. Secretary, Paul B. Freeman, 316 No. Wallace St., Indianapolis, Ind.

PITTSBURGH meets first Wednesday of each month at the Gateway Plaza. Dinner at 6:30 P.M., meeting at 8:00 P.M. Secretary, F. W. Stevens, 79 Summit Ave., Ellwood City, Pa. Research finance committee chairman, M. Ceresa, 207 Highland Rd., Pittsburgh, Pa.

SYRACUSE meets third Monday of each month at 6:30 P.M. at the Liederkranz, 621 Butternut St., Syracuse, N. Y. Secretary, M. F. Stevenson, 313 Beech St., North Syracuse 12, N. Y. Research finance committee chairman, K. S. Parnell, 829 Maryland Ave., Syracuse, N. Y.

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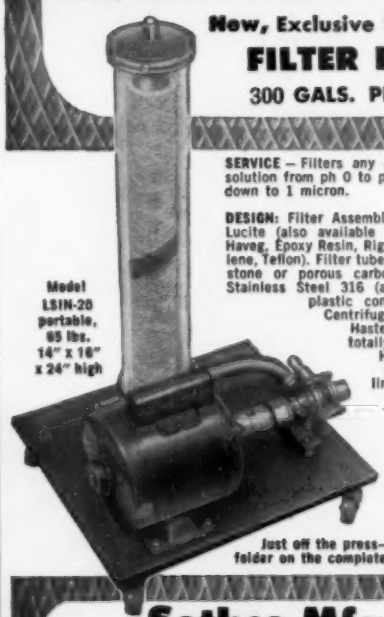

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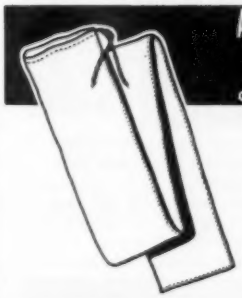

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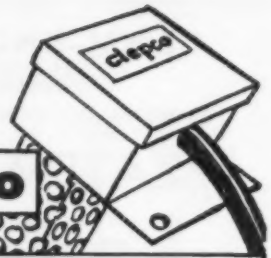

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Latest Complete Branch Directory appeared in the September 1956 issue.

FUTURE MEETINGS

AES

November 30—**Annual Technical Session,** Performance of Plated Coatings, Detroit Branch, Sheraton Cadillac Hotel, Detroit, Mich.

December 14—**Annual Meeting,** Newark Branch, Robert Treat Hotel, Newark, N. J.

December 15—**Christmas Party,** Newark Branch, Robert Treat Hotel, Newark, N. J.

January 12, 1957 **Interim Meeting,** AES Supreme Society, PennSheraton Hotel, Pittsburgh, Pa.

March 30, 1957—**Third Annual Tri-State Regional Meeting,** French Lick Sheraton Hotel French Lick, Ind.

April 27, 1957—**Third Empire State Regional Meeting,** Grand Ballroom, Onondaga Hotel, Syracuse, New York.

April 27, 1957—**Symposium,** Important Engineering Consideration In The Plating Room, Milwaukee Branch, Hotel Schroeder, Milwaukee, Wisc.

June 16-20, 1957—**44th AES Annual Convention** Sheraton-Mt. Royal Hotel, Montreal, Canada.

INTERSOCIETY

January 28-31, 1957—**Plant Maintenance and Engineering Conference and Show,** Public Auditorium, Cleveland, Ohio.

May 12-16, 1957—**Electrochemical Society,** Statler Hotel, Washington, D. C.

May 22-24, 1957—**11th Annual Convention and Exposition,** American Society for Quality Control, Masonic Temple, Detroit, Mich.

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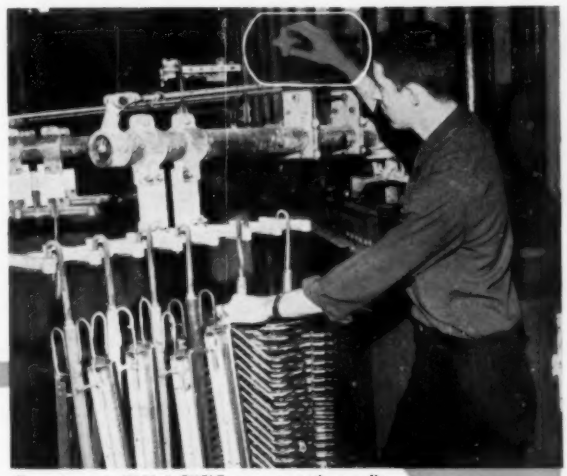

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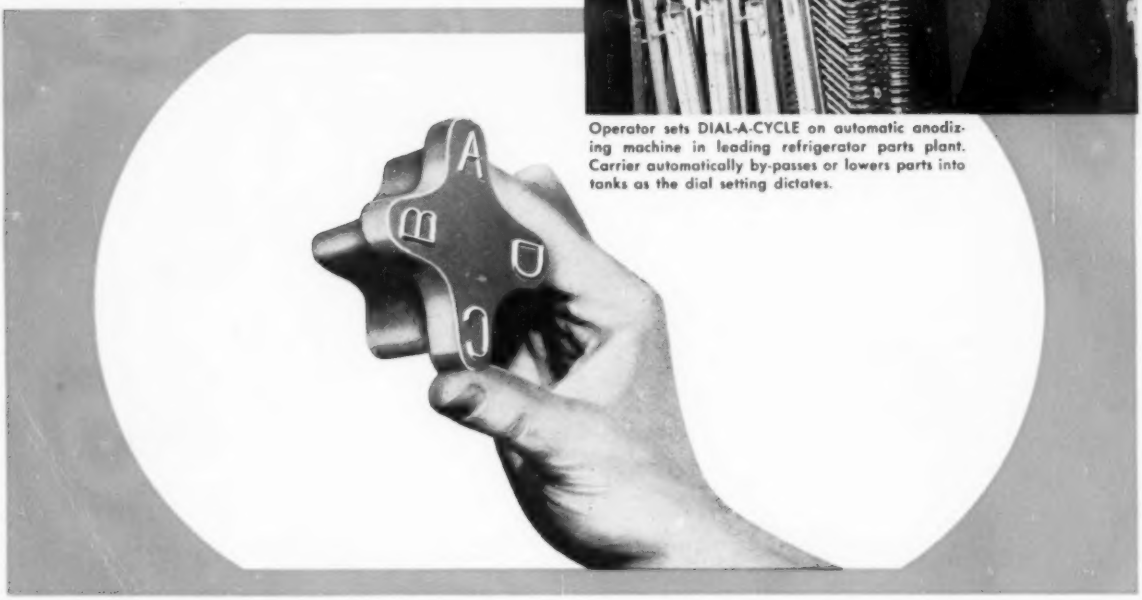

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